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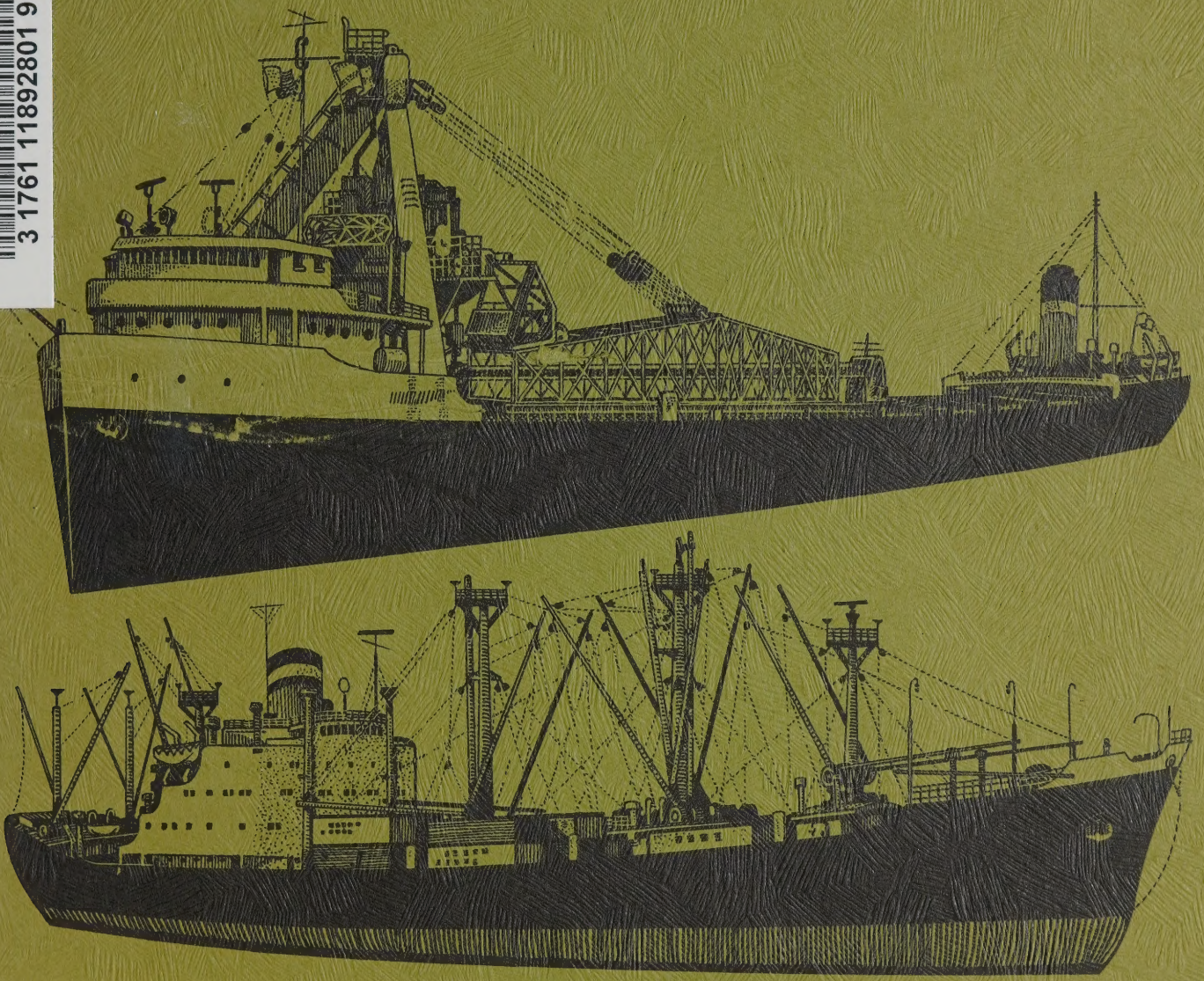
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# THE SEAWAY AND THE PROVINCE OF ONTARIO

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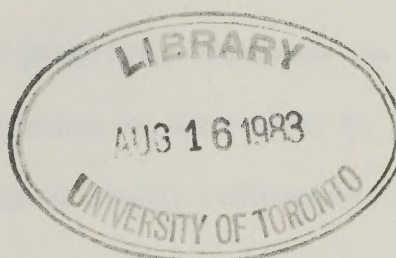




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AND THE  
PROVINCE OF ONTARIO



Ministry of Transportation and  
Communications  
Economic Policy Office  
Modal Studies Section

August 1977



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## SUMMARY

When the St. Lawrence Seaway was constructed, there was a legal obligation for all its construction, operation and maintenance costs to be recovered by user charges. After sixteen years of operation, it has become clear that this obligation will not be met. As a consequence, the Federal Government has announced that tolls on the Seaway will be increased. The present level of tolls has not been sufficient to cover the annual operating and maintenance costs in recent years. As a result, the interest charges on the outstanding construction debt have mounted steadily.

The Federal Government proposes to eliminate the construction and interest debt accumulated by the Seaway by converting it to equity, and to increase the level of tolls sufficiently for the yearly operation of Seaway facilities to become self-sustaining.

### Background

The toll increase proposal has generated great concern because of the potential impact increased tolls could have on users. The St. Lawrence Seaway is a full-fledged transportation network, serving and sustaining much of Canada's agricultural, extractive and manufacturing industries. It constitutes a large segment of the transport sector, linking the Great Lakes and lower St. Lawrence ports, and in one way or another, touches on almost all aspects of the Canadian economy.



This study is an attempt to establish the probable impact of a toll increase on the Ontario-based users of the Seaway, as well as on the economy of the Province.

In the past, there has been opposition to tolls on inland waterways. Other transportation modes were heavily subsidized and an expansionary fiscal climate prevailed at all levels of government. In this environment, it did not seem fair to expect the Seaway to be the only mode to completely return all operating, maintenance and capital costs. The unhealthy slack which has persisted in the Canadian economy has finally brought back into public focus the need for governments to review and re-assess their fiscal practices and spending policies. Specifically, in the transport sector, the unreasonable legal requirements for Seaway capital recovery, and the resulting uncertainties which were generated in the users; plans, had to be resolved.



### Physical Description and History

The study examines the Seaway System as a physical structure and describes the salient points of its recent history. A brief description of each one of the sections of the Seaway is given. The engineering characteristics of each set of locks are fairly similar, but the financial and jurisdictional history varies from section to section.

The main concentration is on the Montreal - Lake Ontario and Welland portions of the System. The Sault Ste. Marie locks are the subject of a brief discussion.

### Legal Aspects

The authority to increase tolls on the Montreal - Lake Ontario sections of the Seaway System rests with both the United States and Canada. Tolls can only be increased by agreement between the two nations. However, the Welland section is entirely within Canadian jurisdiction, and no external approval is legally required for tolls to be imposed or increased.

The United States can retaliate against discriminatory action taken by any nation, against ships of U.S. registry. However, Canada's proposals will not discriminate against any flag, and would continue to treat U.S. and Canadian flags equally.



No legislation was found which would either commit the Canadian Government to toll-free waterways, or force Canada to consult with the U.S. on toll increases for waterways other than boundary waterways. The Montreal - Lake Ontario section of the Seaway is a boundary waterway, however, the Welland Canal is not.

### Financial

The St. Lawrence Seaway Authority has seen its costs increase year to year, while its revenues have remained fairly constant. Statutorily, the St. Lawrence Seaway Authority is compelled to repay to the Federal Government the original Seaway construction debt, as well as the interest accumulated over the years. The debt has grown to a point where it cannot be expected to be repaid, because a toll level sufficiently high to recoup the total debt would direct traffic away from the Seaway System.

It is possible to eliminate this debt since the financing was from the general revenues of Canada. No bonds or debentures exist. However, the yearly operating and maintenance deficits are real and continuing expenses. The central issue is whether taxes should be used to finance the year-to-year maintenance of the Seaway.



## Competition

If tolls are increased, several things may happen to established traffic patterns. Either there will be no impact, or traffic will be diverted to other modes, or it will switch origin-destination patterns to avoid portions of the Seaway, or traffic may cease to flow altogether.

Whether any of these events takes place depends as much on the amount of the toll increase as on the actual physical possibilities available for switching. It also depends on the prices and capacity limitations of the alternative services.

No material was available to draw conclusions on the U.S. traffic. On the Canadian side, all the evidence available to the analysts indicated that the proposed toll increase is not large enough to make many switches attractive. With one or two minor exceptions, the main tonnages that are of interest to Ontario and are using the Seaway, show captivity to the water mode. There is no capacity to handle these large volumes of traffic in any alternative way. In most cases, alternative modes are more expensive even after a toll increase of the magnitude planned. In addition, it is expected that rates on alternative modes will be increased as soon as tolls are.

There exists a possibility that the U.S. will build an exclusively American waterway as an alternative to the Seaway. The magnitude of the proposed toll increase is insignificant in



relation to the eventual costs of implementing this plan in the U.S. The American proposal is, by itself, not a valid argument for maintaining the present level of tolls.

### Conclusions

The data base for this study included amongst other things, a survey of the industrial users of the Seaway. Analysis of the entire data base has led to the following conclusions:

Overall, no significant impacts on Canadian traffic are foreseen. Cautions are raised about impacts on a few special goods, as well as on the low value/high bulk commodities.

The large movements of significance to the province, iron-ore, coal and grain, will not be affected by the toll increase. There will be some switching of delivery patterns of high bulk/low value commodities. However, without detailed case-by-case study, no conclusions as to the specifics of these changes can be drawn.

Port activity, for the major Ontario ports, is expected to remain unaffected on the basis of the traffic these ports have handled historically.

Because no major direct impact is foreseen on Canadian traffic, no induced changes in employment, production patterns or business activity are anticipated unless the American traffic is diverted by toll increases.



The carrier industry has indicated that it will probably curtail shipbuilding in the medium term future. This action has been largely predicated on the general stagnant level of the economy, and cannot be solely attributed to the toll increase.

Some pressure is certain to arise for price increases on steel and electricity. Also, switches in price patterns for sand, gravel, stone, cement, as well as chemicals and fuel oil are possible, but cannot be expected to be significant. These changes will result from the shift to user financing in the Seaway, and should be expected to work their way through the pricing structure.



### New Developments

While this report was being printed, the details of the toll increase proposal were changed. Most of the changes reflect adjustments and concessions made during negotiations with U.S. officials. A few other changes, as e.g. the lower tariffs on grain and the greater range of variation in tariff types, are probably intended to remove or appease some of the opposition to the increase.

The official version of this last proposal is reproduced in full in the Appendix.

The new toll structure is still designed to cover the total cost of operating the two sections of the Seaway. The relative payment burden, however, has shifted more onto the Lake Ontario - Montreal section. This shift, together with the greater spread of tariffs, implies that there will be more cross-subsidization than originally intended.



The U.S. Government has recently held a series of hearings on the impact of increased tolls on U.S. traffic. Examination of the submissions to these hearings raises reasonable doubt about some of the conclusions arrived at earlier. Seaway traffic flows are at present in balance, upbound and down bound. If the U.S. steel industry does react to toll increases as their submissions suggest, flows will become unbalanced, shipping costs will be forced upward by empty backhauls, and Canadian traffic will be affected.

In summary the proposal to eliminate the capital debt appears sound. However the wisdom of toll increases at this point in time is open to debate.





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## BACKGROUND

### Events Leading to this Study

Since 1973 the St. Lawrence Seaway Authority has had to finance a substantial part of its operation from parliamentary appropriations which supplemented the revenue gained from user tolls.

On May 7, 1976, Mr. Paul Normandeau, President of the St. Lawrence Seaway Authority, requested financial assistance from the Standing Committee on Transport and Communications to cover deficits faced by the Authority.

Part of these deficits had arisen from the operation and maintenance of the Welland Canal portion of the St. Lawrence Seaway System. On this occasion, Mr. Normandeau informed the Standing Committee about proposals for a change in financing of the Seaway that he had made to the Minister of Transport.

He recommended that the present financing structure (explained in detail in the body of this report), be re-appraised. The original structure required that the Seaway liquidate its total debt including construction and interest costs through direct charges to users. In summary, Mr. Normandeau proposed that the capital debt, construction and improvements be converted to equity of the Federal Government, that the accumulated interest charged be forgiven and that the yearly operating and maintenance cost of the facility be recovered through appropriate charges to the users of the facility.

Because of early rumors, press publicity and public uncertainty on the details of the federal toll increase proposal, opposition became very strong and vocal before the actual plan was announced. Most users feared that the new charges would be designed to cover the capital and interest debt accumulated by the Authority over the years.

In early 1977, the Ministry of Transportation and Communications assessed the problem in order to prepare recommendations for an eventual provincial position on the matter of Seaway tolls. Given the dearth of facts, as no official federal announcement has been made, it was only possible to explore the broad nature of the problem. Early findings led to recommending that the Federal Government should be asked not to initiate any action unless it was proven that such action would not harm the economy or result in resource misallocation. A letter to this effect was sent to Mr. Lang.

In the summer of 1977, Mr. Lang announced officially that tolls on the St. Lawrence Seaway System would be increased by; replacing the fixed lockage fee on the Welland Canal with a variable toll structure, and by increasing the level of tolls on the Montreal-Lake Ontario section by ten percent. The Welland Canal tolls would amount to 40 cents a ton for bulk cargo and 90 cents a ton for general cargo, as well as four cents for each gross registered ton of the vessel. After this announcement, international negotiations with the U.S. altered some of the specific details of the toll increase proposal. A



proportionately larger share of the increase is proposed to be levied on the Montreal-Lake Ontario section, while the increases on the Welland Canal will be less steep. As well, some differentiation in the treatment of various commodities will be implemented.

The Premier of Ontario was approached by some of the major shippers and carriers using the System (Stelco, Dofasco, Maple Leaf Mills, Ontario Paper and Upper Lakes Shipping) who asked for Ontario support in opposing the federal toll increase.

At this meeting, the Premier promised the industry representatives that with their cooperation, a study would be undertaken by the Province. This study would investigate the facts and determine the impacts of the proposed federal action on the shippers, carriers and the economy of Ontario. Provincial action would be taken in light of the conclusions of this study.

The present work is the result of the study undertaken by the province to determine the impacts of Seaway toll increases.

### The Study

To conduct the study, the Ministry designed "shipper" and "carrier" questionnaires to gain a better understanding of both the operational problems of the marine industry, and the impacts of the proposed toll

increase on the shipping industry and the provincial economy. These questionnaires were either mailed or personally handed out. In addition, all industry representatives were interviewed in person by the Ministry with the exception of a few firms who thought that a telephone interview would suffice. The initial part of each interview was spent in ensuring that the respondents were aware of the details of the federal proposal, and that they understood what type of factual information was needed to assess all the impacts. Representatives of each of the companies which had approached the Premier were interviewed. In addition, it was deemed necessary to include in the sample other shippers and carriers to broaden the data base. The conclusions derived from these interviews can be found in the Provincial Impacts section of this report. Some of the comments and responses were also used in other sections of this study.

In the hopes of clarifying the problem and removing some of the misconceptions held by many people on this topic, this report describes the Seaway System, outlines its history and gives a broad perspective to the most crucial aspects of the current issues.

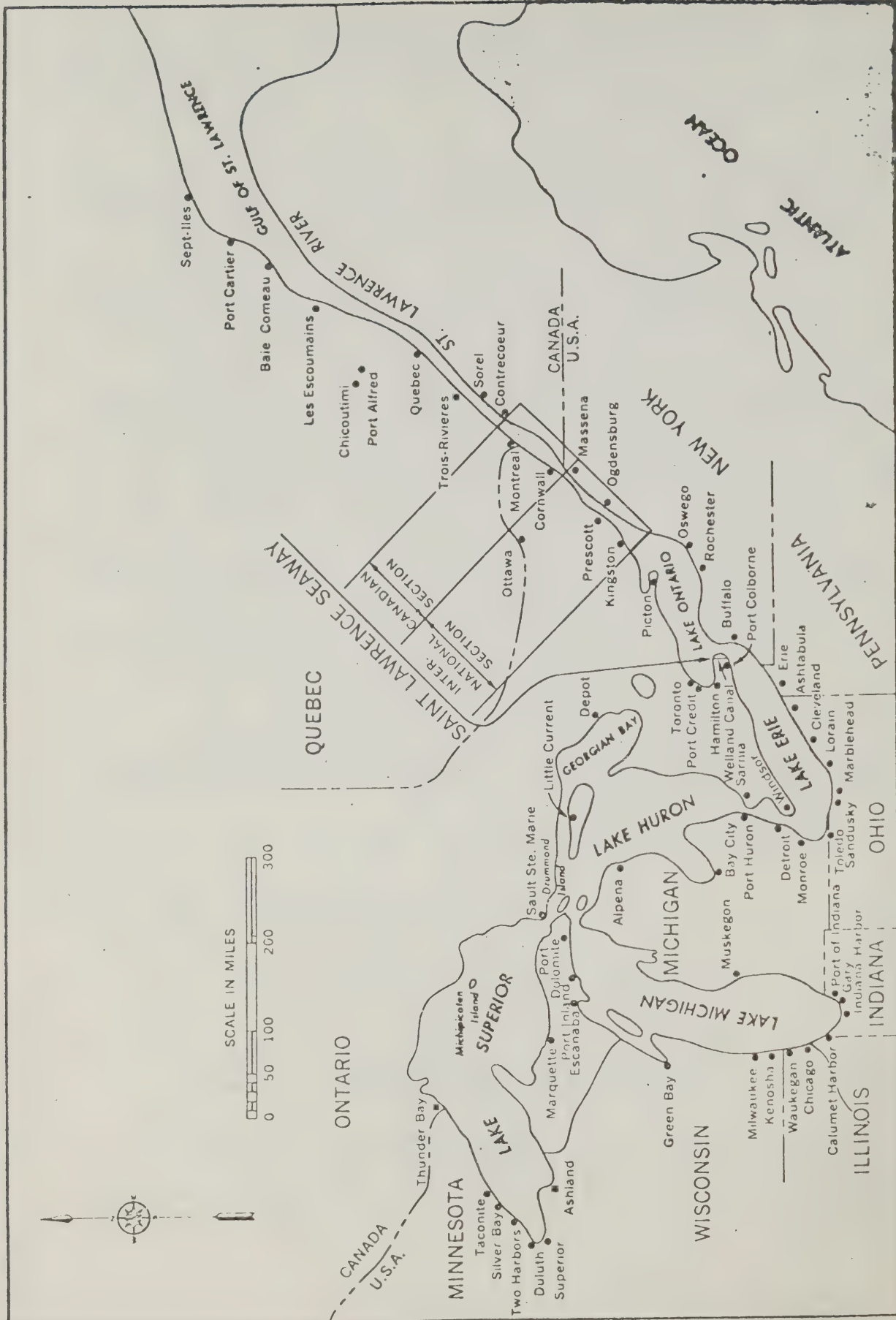


## PHYSICAL DESCRIPTION AND HISTORY

### General

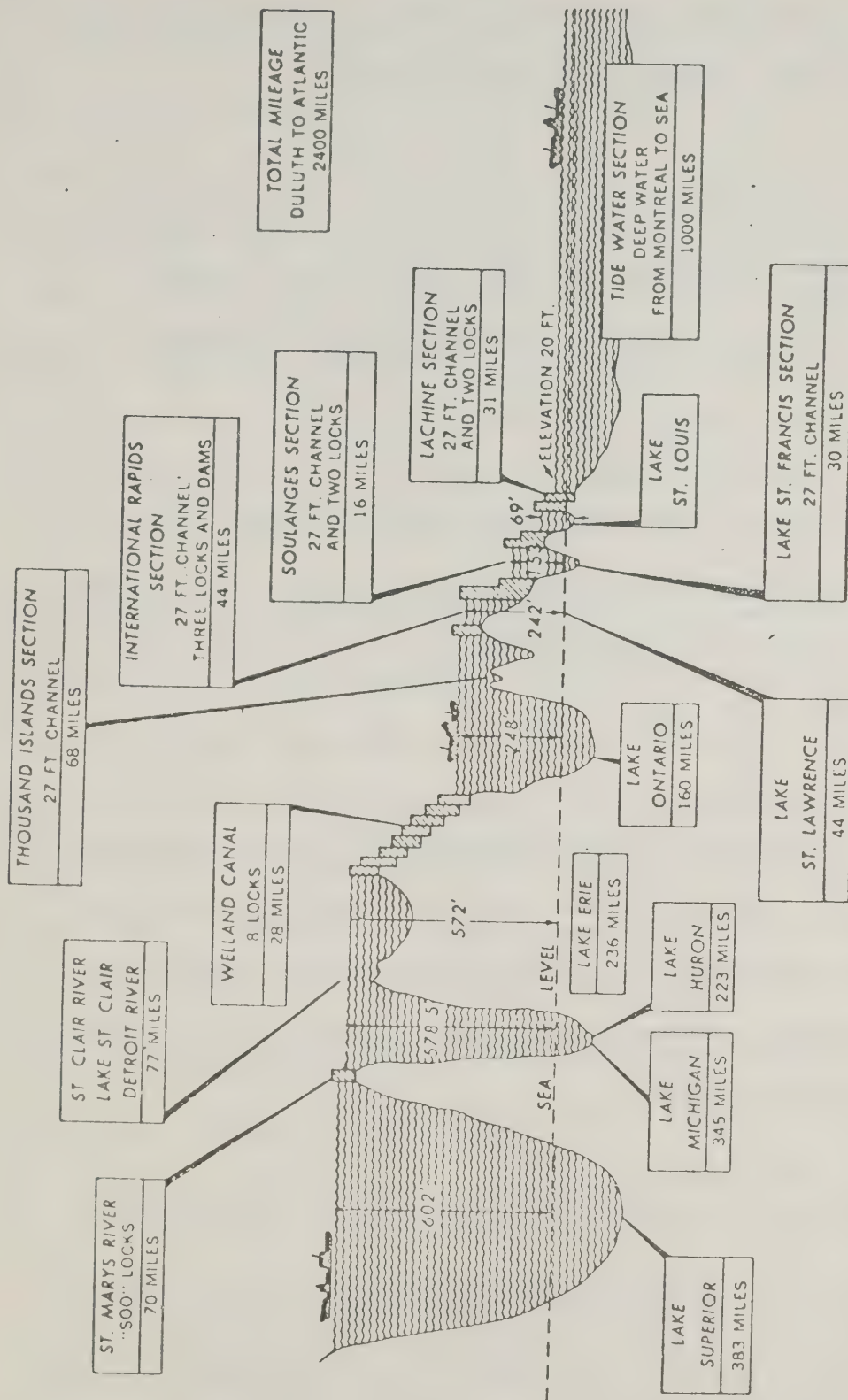
The Great Lakes system is one of the main transportation networks serving the heartland of the North American continent. The five Great Lakes span a surface of just under 100,000 square miles and penetrate 1,300 miles into the continent. While a large portion of the transportation on the system is intralake, or uses the natural passageways connecting the lakes, the ability of the total system to serve as an effective transportation network hinges on three sets of canals and locks. The St. Lawrence Seaway locks circumvent the St. Lawrence rapids and give ships access from the Atlantic to Lake Ontario, the easternmost of the Great Lakes. Further upstream, the passage between Lake Ontario and Lake Erie is made possible by the Welland Canal. The last barrier to navigation is the St. Mary's River, at Sault Ste. Marie. Here the "Soo" locks allow traffic to move into and out of Lake Superior.

The present network of locks is the result of a long historical process of technological improvements, private and government projects and finally the joint construction by U.S. and Canada of the locks and dams in the Montreal-Lake Ontario section (finished in 1959), the Canadian construction and realignment of the Welland Canal, and the construction and expansion of one Canadian and the four U.S. locks at Sault Ste. Marie.



GREAT LAKES—ST. LAWRENCE SEAWAY NAVIGATION SYSTEM





## PROFILE OF GREAT LAKES - ST. LAWRENCE SEAWAY SYSTEM

SOURCE: International Great Lakes Levels Board, Regulation of Great Lakes Water Levels, Appendix E., Commercial Navigation. Report to the International Joint Commission, 1973, p. E-7.

### The Montreal-Lake Ontario Section

This section of the system contains seven locks. Each lock is 766 feet long, 80 feet wide and over 30 feet deep, allowing passage of the seaway to ships 730 feet long, loaded to a draft of 25.9 feet.

Five of the seven locks are owned by Canada, they are operated by the St. Lawrence Seaway Authority. The other two locks are owned by the U.S.A. and operated by the St. Lawrence Seaway Development Corporation.

A long dreamt of project, surrounded with constant and heated polemics, the St. Lawrence Seaway System was finally given construction approval in 1954 by the Governments of Canada and the United States who undertook its construction jointly.

Construction of the present structure was begun in 1954 and finished five years later in 1959. Thus, the seven new locks replace the twenty-two locks which were in use up to 1959, and are the last in a series of construction and expansion projects which go back practically to the earliest days of the colony in Canada.

The St. Lawrence Seaway System would probably never have been built had it not been for the simultaneous construction of huge power dams to generate electricity for the province of Ontario and the State of New York. In fact, it was this latter project which absorbed all those costs common

to both seaway and dam construction. Much of the public opposition to the project died down when discovery of iron ore deposits in Quebec and Labrador revealed an immediate utility for the new seaway. A precondition for approval of the seaway project, however, was the statutory commitment to make it self-liquidating within a reasonable period of time. Toll committees were formed by the two countries and charged with devising a system of toll collection which would guarantee repayment of the project construction, maintenance and operations costs over a period of fifty years. The total costs included deepening and repair works in the Welland Canal to bring it up to the new seaway standards.

In Canada, the St. Lawrence Seaway Authority was established by act of parliament to administer and operate the new seaway. The St. Lawrence Seaway Authority, reporting to the Minister of Transport, is responsible for the Canadian Great Lakes-Seaway System canals and locks. It also operates some other structures under federal jurisdiction. In the United States a similar special agency was created to look after the U.S. portion of the Seaway. The authority of the U.S. St. Lawrence Seaway Development Corporation does not, however, extend beyond the Montreal-Lake Ontario section, as most inland waterway projects in the United States are the responsibility of the U S. Army Corps of Engineers.

It is not often realized what kind of project the seaway construction really was. As it is not surrounded with the aura of international intrigue which has established the fame of the Suez Canal, or lacks the



international strategic importance of the Panama Canal, the legend which it justly deserves has not been created. Suffice it to say that the total project including the dams, was one of the biggest in size and comparatively fastest in terms of execution ever undertaken.\* In sheer magnitude and complexity of the engineering feats it exceeds both the Panama and Suez canals and is surely a part of the national heritage to be proud of.

Quoting from p.174 of Vol. 16 of Encyclopedia Britannica:

"The seaway project is considered one of man's greatest engineering feats. Locks in the seaway and Canada's Welland Canal raise and lower large ships 557 feet; the world's greatest waterway lifting operation. It takes only about 7 minutes for 22,000,000 gallons of water to pour in or out of a seaway lock, but the average locking takes about 33 minutes. The total seaway system overcomes a 602-foot drop from Lake Superior to the sea. To overcome the navigational hazard of the swift-flowing 226-foot fall of the St. Lawrence River between Lake Ontario and Montreal, and to develop its power potential, required an investment of more than \$1,000,000,000. It employed 22,000 workers and utilized \$70,000,000 of construction equipment, enough cement to build a 1,000-mile highway and enough steel to girdle the earth. Communities containing 6,500 people had to be relocated, bridges raised, and tunnels, dikes and roads constructed.

The navigation portion of the project included a \$332,500,000 expenditure by the Canadian government to build two canals and five locks around Soulages and Lachine Rapids and three seaway dams, and \$133,500,000 spent by the U.S. government to build two locks, a ten-mile canal around the International Rapids, and two seaway dams, and to clear shoals from the Thousand Islands section of the river. This series of operations created a 27-foot deep waterway, replacing six canals and 22 locks limited to 14-foot depth. Opening of the seaway required many other projects

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\* A vivid account of the history and problems of construction is given in Jacques LesStrang's very readable book "Seaway", (Superior Publishing Co., Printed by Evergreen Press Ltd., Vancouver, B.C., 1976).

as well. The U.S. Army Corps of Engineers spent about \$200,000,000 to deepen the Straits of Mackinac, between Lake Michigan and Lake Huron; the St. Mary's River, between Lake Superior and Lake Huron; the Detroit River, Lake St. Clair and the St. Clair River, between Lake Erie and Lake Huron; and many Great Lakes harbours. Between 1913 and 1932, Canada had spent \$132,000,000 to build seven lift locks of seaway dimensions in the Welland Canal, which overcomes the 326-foot plunge of the Niagara River and Falls, between Lake Erie and Lake Ontario.

To tap the energy of the St. Lawrence River's tumbling waters, the seaway project included a power dam containing 32 hydroelectric turbine generators and two related dams to control and direct the full force of the river through the power dam. The \$600,000,000 cost and 1,600,000 kilowatts of generating capacity were shared equally by the Hydro-Electric Power Commission of Ontario and the Power Authority of the State of New York. The dams created a 30-mile lake. Generation of hydro-electric power began in July 1958."

As stated above, the authorities responsible on both sides were charged with collecting the tolls which were determined by the toll committees as being sufficient to recover all costs over a fifty-year period. The level of tolls was established on the basis of the traffic forecast generated at the time, allocating higher tolls to high valued goods and lower tariffs for bulk movements.

The following two pages, excerpted from the Canadian Toll Committee report reveal the initial costs and the basis of the calculation made at the time. (\*)

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\* St. Lawrence Seaway Authority, Canadian Tolls Committee "Report of Tolls Committee". June 12, 1958.

ST. LAWRENCE SEAWAY

MONTREAL TO LAKE ONTARIO

UNITED STATES AND CANADA COMBINED

ESTIMATED REVENUE, EXPENSES AND AMORTIZATION

Year	Tons (Millions)	Revenue	Operation and Maintenance Expenses	Net Revenue (Available for Debt Service)	Accrued Interest Paid Currently	Deferred	Payment on Principal and Deferred Interest	Debt Outstanding
1959	25 <sup>1</sup>	13,100,000	3,200,000	9,900,000	9,900,000	2,868,750	--	444,868,750
1960	29	15,196,000	4,272,000	10,924,000	10,924,000	6,212,126	--	451,080,876
1961	33	17,292,000	4,272,000	13,020,000	13,020,000	4,356,344	--	455,437,220
1962	37	19,388,000	4,272,000	15,116,000	15,116,000	2,429,079	--	457,866,299
1963	41	21,484,000	4,272,000	17,212,000	17,157,206	482,365	54,794	458,293,870
1964	44	23,056,000	4,272,000	18,784,000	17,656,948	--	1,127,052	457,166,818
1965	47	24,628,000	4,272,000	20,356,000	17,614,429	--	2,741,571	454,425,247
1966	48	25,152,000	4,272,000	20,880,000	17,509,698	--	3,370,302	451,054,945
1967	49	25,676,000	4,272,000	21,404,000	17,380,750	--	4,023,250	447,031,695
1968	50	26,200,000	4,272,000	21,928,000	17,226,650	--	4,701,350	442,330,345
1969	50	26,200,000	4,272,000	21,928,000	17,046,075	--	4,881,925	437,448,420
1970	50	26,200,000	4,272,000	21,928,000	16,858,538	--	5,069,462	432,378,958
1971	50	26,200,000	4,272,000	21,928,000	16,663,770	--	5,264,230	427,114,728
1972	50	26,200,000	4,272,000	21,928,000	16,461,492	--	5,466,508	421,648,220
1973	50	26,200,000	4,272,000	21,928,000	16,251,414	--	5,676,586	415,971,634
1974	50	26,200,000	4,272,000	21,928,000	16,033,232	--	5,894,768	410,076,866
1975	50	26,200,000	4,272,000	21,928,000	15,806,634	--	6,121,366	403,955,500
1976	50	26,200,000	4,272,000	21,928,000	15,571,294	--	6,356,706	397,598,794
1977	50	26,200,000	4,272,000	21,928,000	15,326,873	--	6,601,127	390,997,667
1978	50	26,200,000	4,272,000	21,928,000	15,073,020	--	6,854,980	384,142,687
1979	50	26,200,000	4,272,000	21,928,000	14,809,370	--	7,118,630	377,024,057
1980	50	26,200,000	4,272,000	21,928,000	14,535,544	--	7,392,456	369,631,601
1981	50	26,200,000	4,272,000	21,928,000	14,251,145	--	7,676,855	361,954,746
1982	50	26,200,000	4,272,000	21,928,000	13,955,767	--	7,972,233	353,982,513
1983	50	26,200,000	4,272,000	21,928,000	13,648,983	--	8,279,017	345,703,496
1984	50	26,200,000	4,272,000	21,928,000	13,330,351	--	8,597,649	337,105,847
1985	50	26,200,000	4,272,000	21,928,000	12,999,412	--	8,928,588	328,177,259
1986	50	26,200,000	4,272,000	21,928,000	12,655,690	--	9,272,310	318,904,949
1987	50	26,200,000	4,272,000	21,928,000	12,298,689	--	9,629,311	309,275,638
1988	50	26,200,000	4,272,000	21,928,000	11,927,894	--	10,000,106	299,275,532
1989	50	26,200,000	4,272,000	21,928,000	11,542,769	--	10,385,231	288,890,301
1990	50	26,200,000	4,272,000	21,928,000	11,142,762	--	10,785,238	278,105,063
1991	50	26,200,000	4,272,000	21,928,000	10,727,292	--	11,200,708	266,904,355
1992	50	26,200,000	4,272,000	21,928,000	10,295,762	--	11,632,238	255,272,117
1993	50	26,200,000	4,272,000	21,928,000	9,847,548	--	12,080,452	243,191,665
1994	50	26,200,000	4,272,000	21,928,000	9,382,003	--	12,545,997	230,645,668
1995	50	26,200,000	4,272,000	21,928,000	8,898,456	--	13,029,544	217,616,124
1996	50	26,200,000	4,272,000	21,928,000	8,396,206	--	13,531,794	204,084,330
1997	50	26,200,000	4,272,000	21,928,000	7,874,529	--	14,053,471	190,030,859
1998	50	26,200,000	4,272,000	21,928,000	7,332,670	--	14,595,330	175,435,529
1999	50	26,200,000	4,272,000	21,928,000	6,769,848	--	15,158,152	160,277,377
2000	50	26,200,000	4,272,000	21,928,000	6,185,246	--	15,742,754	144,534,623
2001	50	26,200,000	4,272,000	21,928,000	5,578,021	--	16,349,979	128,184,644
2002	50	26,200,000	4,272,000	21,928,000	4,947,294	--	16,980,706	111,203,938
2003	50	26,200,000	4,272,000	21,928,000	4,292,153	--	17,635,847	93,568,091
2004	50	26,200,000	4,272,000	21,928,000	3,611,649	--	18,316,351	75,251,740
2005	50	26,200,000	4,272,000	21,928,000	2,904,797	--	19,023,203	56,228,537
2006	50	26,200,000	4,272,000	21,928,000	2,170,574	--	19,757,426	36,471,111
2007	50	26,200,000	4,272,000	21,928,000	1,407,918	--	20,520,082	15,951,029
2008	50 <sup>2</sup>	20,838,751	4,272,000	16,566,751	615,722	--	15,951,029	--
Add: Deferred Interest to Current Interest Payments					16,348,664			
Deduct: Deferred Interest From Pay- ments on Principal						16,348,664		
Total - 50 Years		1,253,810,751	212,528,000	1,041,282,751	599,282,751	--	442,000,000	
Average per year		25,076,215	4,250,560	20,825,655	11,985,655	--	8,840,000	

<sup>1</sup> The Seaway is scheduled to commence operating for toll traffic on April 1, 1959. Accordingly, the figures shown on this line are for 9 months only. All expenses, including interest during construction prior to April 1, 1959, are to be capitalized.

<sup>2</sup> The gross and net revenues shown for this year are only the amounts sufficient to cover expenses, and to complete the amortization of the debt and the accrued interest thereon.

Source: The St. Lawrence Seaway Authority Canadian Tolls  
Committee: Report of Tolls Committee. June 12, 1958.  
Table A.



ST. LAWRENCE SEAWAY

WELLAND CANAL

ESTIMATED REVENUE, EXPENSES AND AMORTIZATION

Year	Tons (Millions)	Toll Revenue At 5.15	*Operation and Maintenance Expenses	Net Revenue Available For Debt	Accrued Interest Paid On Current	Deferred	Payment on Principal and Deferred Interest	Debt Outstanding
1959	**40	2,060,000	1,200,000	860,000	860,000	10,000	--	29,010,000
1960	43	2,215,000	1,600,000	615,000	615,000	545,400	--	29,555,400
1961	46	2,369,000	1,600,000	769,000	769,000	413,216	--	29,968,616
1962	50	2,575,000	1,600,000	975,000	975,000	223,745	--	30,192,361
1963	53	2,730,000	1,600,000	1,130,000	1,130,000	77,694	--	30,270,055
1964	55	2,833,000	1,600,000	1,233,000	1,210,802	--	22,198	30,247,857
1965	57	2,935,000	1,600,000	1,335,000	1,209,914	--	125,086	30,122,771
1966	58	2,937,000	1,600,000	1,387,000	1,204,911	--	182,089	29,940,682
1967	59	3,038,000	1,600,000	1,438,000	1,197,627	--	240,373	29,700,309
1968	60	3,090,000	1,600,000	1,490,000	1,188,012	--	301,988	29,398,321
1969	60	3,090,000	1,600,000	1,490,000	1,175,933	--	314,067	29,084,254
1970	60	3,090,000	1,600,000	1,490,000	1,163,370	--	326,630	28,757,624
1971	60	3,090,000	1,600,000	1,490,000	1,150,305	--	339,695	28,417,929
1972	60	3,090,000	1,600,000	1,490,000	1,136,717	--	353,283	28,064,646
1973	60	3,090,000	1,600,000	1,490,000	1,122,586	--	367,414	27,697,232
1974	60	3,090,000	1,600,000	1,490,000	1,107,889	--	382,111	27,315,121
1975	60	3,090,000	1,600,000	1,490,000	1,092,605	--	397,395	26,917,726
1976	60	3,090,000	1,600,000	1,490,000	1,076,709	--	413,291	26,504,435
1977	60	3,090,000	1,600,000	1,490,000	1,060,177	--	429,823	26,074,612
1978	60	3,090,000	1,600,000	1,490,000	1,042,984	--	447,016	25,627,596
1979	60	3,090,000	1,600,000	1,490,000	1,025,104	--	464,896	25,162,700
1980	60	3,090,000	1,600,000	1,490,000	1,006,508	--	483,492	24,679,208
1981	60	3,090,000	1,600,000	1,490,000	987,168	--	502,832	24,176,376
1982	60	3,090,000	1,600,000	1,490,000	967,055	--	522,945	23,653,431
1983	60	3,090,000	1,600,000	1,490,000	946,137	--	543,863	23,109,568
1984	60	3,090,000	1,600,000	1,490,000	924,383	--	565,617	22,543,951
1985	60	3,090,000	1,600,000	1,490,000	901,758	--	588,242	21,955,709
1986	60	3,090,000	1,600,000	1,490,000	878,228	--	611,772	21,343,937
1987	60	3,090,000	1,600,000	1,490,000	853,757	--	636,243	20,707,694
1988	60	3,090,000	1,600,000	1,490,000	828,308	--	661,692	20,046,002
1989	60	3,090,000	1,600,000	1,490,000	801,840	--	688,160	19,357,842
1990	60	3,090,000	1,600,000	1,490,000	774,314	--	715,686	18,642,156
1991	60	3,090,000	1,600,000	1,490,000	745,686	--	744,314	17,897,842
1992	60	3,090,000	1,600,000	1,490,000	715,914	--	774,086	17,123,756
1993	60	3,090,000	1,600,000	1,490,000	684,950	--	805,050	16,318,706
1994	60	3,090,000	1,600,000	1,490,000	652,748	--	837,252	15,481,454
1995	60	3,090,000	1,600,000	1,490,000	619,258	--	870,742	14,610,712
1996	60	3,090,000	1,600,000	1,490,000	584,428	--	905,572	13,705,140
1997	60	3,090,000	1,600,000	1,490,000	548,206	--	941,794	12,763,346
1998	60	3,090,000	1,600,000	1,490,000	510,534	--	979,466	11,783,880
1999	60	3,090,000	1,600,000	1,490,000	471,355	--	1,018,645	10,765,235
2000	60	3,090,000	1,600,000	1,490,000	430,609	--	1,059,391	9,705,844
2001	60	3,090,000	1,600,000	1,490,000	388,234	--	1,101,766	8,604,078
2002	60	3,090,000	1,600,000	1,490,000	344,163	--	1,145,837	7,458,241
2003	60	3,090,000	1,600,000	1,490,000	298,330	--	1,191,670	6,266,571
2004	60	3,090,000	1,600,000	1,490,000	250,663	--	1,239,337	5,027,234
2005	60	3,090,000	1,600,000	1,490,000	201,089	--	1,288,911	3,738,323
2006	60	3,090,000	1,600,000	1,490,000	149,533	--	1,340,467	2,397,856
2007	60	3,090,000	1,600,000	1,490,000	95,915	--	1,394,085	1,003,771
2008	***51	2,643,922	1,600,000	1,043,922	40,151	--	1,003,771	--
		149,985,922	79,600,000	70,385,922	40,115,867	1,270,055	30,270,055	--
Add: Deferred Interest to Current Interest Payments					1,270,055			
Deduct: Deferred Interest From Payments on Principal							1,270,055	
TOTAL:		149,985,922	79,600,000	70,385,922	41,385,922		29,000,000	--
AVERAGE YEARLY:		2,999,718	1,592,000	1,407,718	827,718		580,000	--

\* Total operation and maintenance expenses less \$750,000 per year average revenue received from land rentals, wharfage, etc.

\*\* The Seaway is scheduled to commence operating for toll traffic on April 1, 1959. Accordingly, the figures shown on this line are for 9 months only. All expenses, including interest during construction prior to April 1, 1959, are to be capitalized.

\*\*\* The gross and net revenue shown for this year are only the amounts sufficient to cover expenses and to complete the amortization of the debt and the accrued interest thereon.

SPD 4 42988

Source: Ibid. Table B.

As shown in the financial section, the initial forecasts were optimistic. The onset of an increased rate of inflation since the early seventies coupled with labour unrest and changing economic conditions given constant toll levels did not make it possible for either authority to begin to pay off the original construction debt nor, to stop the accumulating interest charges from growing ever larger. The situation in Canada at the present is such that the current toll structure is barely sufficient to cover annual operating costs on the Montreal-Lake Ontario section and does not allow for recovery of the operating and maintenance costs on the Welland Canal.

Faced with this situation in 1970, with the passage of the Merchant Marine Act, President Nixon forgave the St. Lawrence Seaway Development Corporation all past, present and future interest on the Seaway debt, making the corporation only responsible for its year to year operating and maintenance costs. The initial construction cost is now the only outstanding long term debt of the Corporation.

At time of writing, the proposal of the Canadian government follows similar lines, its last official version being the following: \*

"OTTAWA -- Transport Minister Otto Lang and Paul Normandeau, President of the St. Lawrence Seaway Authority today announced steps that will be taken to restore the Seaway to financial health."

The following measures will be implemented:

- "1) Parliament is being asked to convert to equity, to be held by the federal government as an investment, the \$625 million debt for loans acquired to construct the Montreal-Lake Ontario section and to upgrade the Welland Canal. In addition, the \$217 million in accumulated unpaid interest charges will be converted into an interest-free loan which is to be forgiven at a later date.

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\* Information pamphlet issued by the Ministry of Transport on March 2, 1977.

- 2) The Seaway Authority will pay to the federal treasury an annual return on the government's equity investment of \$745 million at a rate to be set from time to time by the minister of transport. This return is being set initially at one percent.

In return, the government has directed the Seaway to charge tolls for the transit of its two sections, Montreal to Lake Ontario and the Welland Canal (linking Lake Ontario to Lake Erie and the other upper lakes), that will be sufficient to cover all operation and maintenance costs plus the return on investment already mentioned."

The federal plan in its last version is designed to recover the operating losses on the Welland Canal from the users of this facility.

It is likely that this toll distribution was chosen mainly for strategic reasons.

While it is true that the main thrust for making the seaway project self-liquidating had come from the promptings of the United States, Nixon's forgiveness of the debt has left the U.S. corporation fairly well off in terms of financial commitments. As a result, the U.S. Authority has not been under the same pressure to recover expenditures as has their Canadian counterpart. If the capital repayments are rescheduled to meet the legal requirements, the American Seaway Development Corporation will incur continual losses. The proposals to raise tolls on the wholly Canadian-owned Welland Canal do not resolve the U.S. Authority's potential financial problem. As a result, the U.S. Government has an incentive to enter into negotiations which will give them a share of the increased revenues. This can only be achieved if the tolls on the jointly-owned St. Lawrence section are increased.

#### Welland Section

The history of the Welland is similar to that of the Montreal-Lake Ontario section, but less dramatic, as the development to its present stage has been



more gradual. The 327-ft. difference in elevation between the two lakes is overcome by eight locks designed to seaway dimensions. The first canal opened in 1829. In 1833 the canal was extended, and enlarged between 1871 and 1887. A newer canal was finished in 1932 which received improvements to its southern part in 1972. In 1974 a realignment of a major section to bypass the city of Welland was completed at an approximate cost of \$240,000,000.

### Sault Ste. Marie Locks

The last set of locks on the system, at Sault Ste. Marie, is toll free. The Canadian lock is operated by the St. Lawrence Seaway Authority while the four U.S. locks are run by the U.S. Army Corps of Engineers. The present Canadian lock was built for military purposes in the late 19th century and widened to its present size at a later date. Of its 900-foot length, 850 feet are "usable". It is 60 feet wide and varies in depth from 16 to 21 feet depending on river level. It is kept at 16.8 feet depth from April 5th to December 12th each year.

This lock is obviously not of seaway dimensions and as a consequence looses much traffic to the large U.S. locks parallel to it. At present it is used mainly for pleasure craft. The Canadian Government is now studying the strategic need for expanding the lock as opposed to the alternative of curtailing its operation or closing it down altogether. Thus, the fate of this lock has become a sensitive issue lately.

The dimensions of the parallel U.S. locks in the St. Mary's River are, in feet:

	<u>Length</u>	<u>Width</u>	<u>Depth</u>
Sabin	1350	80	25
Dans	1350	80	23
Poe	1200	110	32
McArthur	800	80	31

The Poe lock is at present the largest capacity lock in the system. Many ships designed to fit this lock are landlocked since they exceed the dimensions of the other locks in the seaway. Principally, U.S. traffic uses the American locks. Some Canadian traffic, mainly wheat (and possibly coal in the future), benefits from the U.S. facilities.

As described in the legal section of this report, the U.S. could take retaliatory measures against Canada on these locks by charging a toll of up to two dollars per ton of cargo, were the Canadian Government to charge tolls elsewhere in the system which the U.S. felt to be discriminatory.

By and large, these are the components of the seaway system as they have developed to the present. A description of strategic and transportation issues is given in the remaining sections of this report.

Future Prospects:

Quoting again from Encyclopedia Britannica, p. 175-176, Vol. 16

"The Great Lakes-St. Lawrence River system is often characterized as a vast inland sea, comparable to the Mediterranean. But it suffers from difficult access and a severe winter climate that shortens the shipping season to about eight months. When constructed, the seaway would admit about 80 percent of the world's ships to this inland waterway. But its limitations of 25-foot-9-inch draft, 730-foot length, and 75-foot-6-inch beam restrict use to vessels carrying no more than about 27,000 tons of cargo, which is becoming small by world trade standards. To deepen the seaway to 35 feet would cost as much as \$5,000,000,000 and such a project would face stiff opposition from competing regions of the U.S. and Canada.

In the early 1970's, studies were underway to extend the shipping season, but costs could prove prohibitive. Traffic experts predicted that seaway use would continue to grow but probably at a reduced rate. Iron ore and grain shipments also were expected to climb. The seaway could gain a major new commodity, as air pollution control regulations on sulfur content of fuels bring about substitution of heavy industrial fuel oils for coal in Midwest power plants and factories. This heavy fuel oil would have to come primarily from the Caribbean through the seaway. Despite a host of problems, the St. Lawrence Seaway is likely to continue playing an important economic role in an area containing about one-third of North America's population.

In addition, the following was the perception of the future of the Seaway of Mr. P. Normandeau, President of the St. Lawrence Seaway Authority in 1976 when he appeared before the Standing Committee.

"I can see the day when the Seaway will revert to an inland waterway. Manufactured goods, which are usually the goods that are included in the general category, have a higher value and therefore benefit from faster transit. With the faster services offered by the container ships and the containers today, yes. We hope to see more general merchandise this year than last year, but last year, as I said, we lost a great deal and that was the fifth consecutive loss. We reached a top in 1971 and ever since the general merchandise has gone down. This year we are looking forward to an increased tonnage, merely because there are more ocean ships scheduled to come through. But,



personally, I see the Seaway as returning to being an inland waterway, and specializing in handling these vast bulk quantities of grains, iron ore, coal. /

Insofar as the capital investments are required, you see, if by 1990 the Seaway is congested we shall have to find ways and means of hauling away our grain, or the larger tonnages of grain, and that will mean trains and very heavy investments.

It so happens that our facilities, even the old Welland Canal, which goes back to the twenties and some of it to before the First World War, are in such condition that it would be sacrilege not to use them to their fullest capacity, and this is what we are trying to find out. We know that the capacity now is somewhere around 90 million tons per year of mixed traffic, but if we were able, through a device such as a shunter, to push that to 100 million or 110 million tons, we would save this country a great deal of money, one way or the other, either by not building another canal or by not building new railway lines."\*

Such capacity limitation problems and need for expansion raise issues that only judicious and well planned investment will be capable of solving.

Activities in this direction are a matter of concern to users of the facility.

This topic is expanded upon in other sections of the study.

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\* Minutes of Proceedings and Evidence of the Standing Committee on Transport and Communications. Issue No. 58, Friday, May 7, 1976, pp. 58:10 and 58:12.

## LEGAL ASPECTS

### General

This section examines the various pieces of legislation which relate to the Seaway, especially those that may have a bearing on toll increases. Arguments related to legislation which have been advanced as reasons for not placing any toll or increase on the Welland Canal are also examined.

According to the British North America Act, matters relating to Navigation and Shipping are the responsibility of the Federal Government. Ontario has a direct interest in the Seaway and Welland Canal by virtue of the necessary service it provides industry, but does not have any jurisdictional authority or responsibility for the system. The legislation examined is therefore all federal.

### Canadian Legislation

International Boundary Waters Treaty Act - 1909 (R.S.C. 1970 Chap. I-20).

This treaty covers boundary waters between Canada and the United States.

The question of tolls is covered by Article I of the Act and reads as follows:

#### Article I

The High Contracting Parties agree that the navigation of all navigable boundary waters shall forever continue free and open for the purposes of commerce to the inhabitants and to the ships, vessels, and boats of both

countries equally, subject however, to any laws and regulations of either country, within its own territory, not inconsistent with such privilege of free navigation and applying equally and without discrimination to the inhabitants, ships, vessels, and boats of both countries.

It is further agreed that so long as this treaty shall remain in force, this same right of navigation shall extend to the waters of Lake Michigan and to all canals connecting boundary waters, and now existing or which may hereafter be constructed on either side of the line. Either of the High Contracting Parties may adopt rules and regulations governing the use of such canals within its own territory and may charge tolls for the use thereof, but all such rules and regulations and all tolls charged shall apply alike to the subjects or citizens of the High Contracting Parties and the ships, vessels, and boats of both of the High Contracting Parties, and they shall be placed on terms of equality in the use thereof.

While this legislation cannot be looked at in isolation it does give Canada the right to increase tolls on the Welland Canal provided there is no discrimination in the application of tolls to the vessels of the United States with respect to those of Canada. Statements have been made by opponents of the increase that Canada cannot act unilaterally in increasing the tolls on the Welland Canal even though it is located entirely within Canadian territory. The question is academic because Canada is not attempting to arbitrarily impose an increase, but is currently conducting negotiations with the United States.

This Act also created the International Joint Commission of the United States and Canada. The Commission has jurisdiction over cases involving the use or obstruction or diversion of the Boundary Waters as outlined in Articles III and IV of the Act. In addition, the Commission may be called upon by the U.S. Senate and the Canadian Governor General in Council to examine and report on matters of differences arising between the two countries.



St. Lawrence Seaway Authority Act (R.S.C. 1970 Chap. S-1)

This act established the St. Lawrence Seaway Authority. The Authority was incorporated for the purposes of acquiring land and constructing, maintaining and operating a deep waterway between the Port of Montreal and Lake Erie. This was to be done in conjunction with the appropriate corresponding authority in the United States.

Section 16 of the Act authorizes the Authority to assess tolls on vessels passing through canals under its administration. Section 17 states that the tolls must be fair and reasonable and be so designed as to cover the cost of operation of the Authority. The costs are described as including:

- (a) payments in respect of the interest on amounts borrowed by the Authority to carry out such purposes;
- (b) amounts sufficient to amortize the principal of amounts so borrowed over a period not exceeding fifty years; and
- (c) the cost of operating and maintaining the canals and works under the administration of the Authority, including all operating costs of the Authority and such reserves as may be approved by the Minister.

This concept of self-liquidation was designed to prevent the financial needs of the Seaway from becoming a burden on the general taxpayer, as well as to prevent misallocation of transportation resources among competing modes.

The National Transportation Act (R.S.C. 1970 Chap. N-17)

The National Transportation Act of 1967 was the culmination of a series of Royal Commissions dating from the Duff Commission in 1932. Section 3 of the Act states the National Transportation Policy which is reproduced below:

It is hereby declared that an economic, efficient and adequate transportation system making the best use of all available modes of transportation at the lowest total cost is essential to protect the interests of the users of transportation and to maintain the economic well-being and growth of Canada, and that these objectives are most likely to be achieved when all modes of transport are able to compete under conditions ensuring that having due regard to national policy and to legal and constitutional requirements,

(a) regulation of all modes of transport will not be of such a nature as to restrict the ability of any mode of transport to compete freely with any other modes of transport;

(b) each mode of transport, so far as practicable, bears a fair proportion of the real costs of the resources, facilities and services provided that mode of transport at public expense;

(c) each mode of transport, so far as practicable, receives compensation for the resources, facilities and services that it is required to provide as an imposed public duty; and

(d) each mode of transport, so far as practicable, carries traffic to or from any point in Canada under tolls and conditions that do not constitute:

(i) an unfair disadvantage in respect of any such traffic beyond that disadvantage inherent in the location or volume of the traffic, the scale of operation connected therewith or the type of traffic or service involved, or

(ii) an undue obstacle to the interchange of commodities between points in Canada or unreasonable discouragement to the development of primary or secondary industries or to export trade in or from any region of Canada or to the movement of commodities through Canadian ports;

and this Act is enacted in accordance with and for the attainment of so much of these objectives as fall within the purview of subject matters under the jurisdiction of Parliament relating to transportation.

At the time of writing, the Minister of Transport had introduced Bill C33, which includes modifications to the above policy statement.

The original Seaway project was presented as a self-liquidating undertaking.

At the time, this was accepted by the shippers and shipping industry.

Upon completion, the productivity of the Great Lakes Marine industry increased to such an extent that rates on grain and ore were reduced and

held at lower levels until inflationary pressure forced an upward adjustment in 1971. However, the level of tolls set in 1959 was inadequate to ensure that the Seaway would be self-supporting.

A new Federal plan proposes to abolish the construction and interest debt of the Seaway Authority.

This proposal appears to be consistent with the principles of the National Transportation Act, which call for equality of treatment among the different modes of transport. The rail, air, and highway modes have all received, in some way, an injection of public capital. Maintaining the present level of tolls would constitute an operating subsidy to the Seaway. Such a subsidy has no parallel on any of the other freight-carrying modes. This would be inconsistent with the National Transportation Policy, and would be likely to distort the economic choices to be made in moving freight in North America.

#### U.S. Legislation

The corresponding American legislation to the Canadian "International Boundary Waters Treaty Act" does not have any specific name. In the American Statutes it is found as a Treaty with Great Britain relating to boundary waters between the United States and Canada. By its very nature, a treaty is identical in content for both parties, as it is a contract between two sovereign bodies. Thus the legislation as outlined under the Canadian section corresponds to the text of the treaty.



Public Law 358 83rd Congress

The St. Lawrence Seaway Development Corporation was established as an independent government corporation in 1954 by Public Law 358, also known as the Wiley-Dondero Act. The Corporation was charged with the responsibility of constructing the U.S. portion of the Seaway, operating, maintaining and financing it.

Section 12 deals specifically with the Rates of Tolls and reads as follows:

Rates of Charges or Tolls

Sec. 12. (a) The Corporation is further authorized and directed to negotiate with the Saint Lawrence Seaway Authority of Canada, or such other agency as may be designed by the Government of Canada, an agreement as to the rules for the measurement of vessels and cargoes and the rates of charges or tolls to be levied for the use of the Saint Lawrence Seaway, and for an equitable division of the revenues of the Seaway between the Corporation and the Saint Lawrence Seaway Authority of Canada. Such rules for the measurement of vessels and cargoes and rates of charges or tolls shall, to the extent practicable, be established or changed only after giving due notice and holding a public hearing. In the event that such negotiations shall not result in agreement, the Corporation is authorized and directed to establish unilaterally such rules of measurement and rates of charges or tolls for the use of the federal register, of any proposals to establish or change unilaterally the rates of charges or tolls, during which period a public hearing shall be conducted. Any such establishment of or changes in basic rules of measurement or rates of charges or tolls shall be subject **to and shall take effect** thirty days following the date of approval thereof by the President, and shall be final and conclusive, subject to review as hereinafter provided.

(b) In the course of its negotiations, or in the establishment, unilaterally, of the rates of charges or tolls as provided in subsection (a), the Corporation shall be guided by the following principles:

(1) That the rates shall be fair and equitable and shall give due consideration to encouragement of increased utilization of the navigation facilities, and to the special character of bulk agricultural, mineral, and other raw materials.

(2) That rates shall vary according to the character of cargo with the view that each classification of cargo shall so far as practicable derive relative benefits from the use of these facilities.

(3) That the rates on vessels in ballast without passengers or cargo may be less than the rates for vessels with passengers or cargo.

### The Merchant Marine Act

The basic purpose of the Merchant Marine Act of 1970 was to authorize a \$1 billion program for the construction of 300 new ships in American yards to revitalize the U.S. Merchant Marine. Amendments to the bill gave to the Great Lakes, the status of Fourth Seacoast. This meant, operating and construction subsidies were extended for U.S. vessels constructed and operated in the Great Lakes. An additional amendment provides for the elimination of past and future interest charges on the Seaway construction debt. The debt itself was not forgiven and the corporation must still repay the original costs of their portion of the Seaway. The covering legislation is reproduced below:

(a) To finance its activities, the Corporation may issue revenue bonds payable from corporate revenue to the Secretary of the Treasury. The total face value of all bonds so issued shall not be greater than \$140,000,000. Not more than fifty per centum of the bonds may be issued during any one year. Such obligations shall have maturities agreed upon by the Corporation and the Secretary of the Treasury, not in excess of fifty years. Such obligations may be redeemable at the option of the Corporation before maturity in such manner as may be stipulated in such obligations, but the obligations thus redeemed shall not be refinanced by the Corporation. The Secretary of the Treasury is

authorized and directed to purchase any obligations of the Corporation to be issued hereunder and for such purpose the Secretary of the Treasury is authorized to use as a public debt transaction the proceeds from the sale of any securities issued under the Second Liberty Bond Act, as amended, and the purposes for which securities may be issued under the Second Liberty Bond Act, as amended, are extended to include any purchases of the Corporation's obligations hereunder.

(b) Effective as of October 21, 1970, the obligations of the Corporation incurred under subsection (a) of this section shall bear no interest, and the obligation of the Corporation to pay the unpaid interest which has accrued on such obligations is terminated.

### St. Mary's Falls Canal Act

This Act was passed in 1892 and deals with the American canals at

Sault Ste. Marie. The purpose of this legislation is outlined in the statute.

With a view of securing reciprocal advantages for the citizens, ports, and vessels of the United States, whenever and so often as the President shall be satisfied that the passage through any canal or lock connected with the navigation of the Saint Lawrence River, the Great Lakes, or the waterways connecting the same, of any vessels of the United States, or of cargoes or passengers in transit to any port of the United States, is prohibited or is made difficult or burdensome by the imposition of tolls or otherwise which, in view of the free passage through the Saint Mary's Falls Canal, permitted to vessels of all nations, he shall deem to be reciprocally unjust and unreasonable, he shall have the power, and it shall be his duty, to suspend by proclamation to that effect, for such time and to such extent (including absolute prohibition) as he shall deem just, the right of free passage through the Saint Mary's Falls Canal, so far as it relates to vessels owned by the subjects of the Government so discriminating against the citizens, ports, or vessels of the United States, or to any cargoes, portions of cargoes, or passengers in transit to the ports of the Government making such discrimination, whether carried in vessels of the United States or of other nations.

In such case and during such suspension tolls shall be levied, collected, and paid as follows, to wit: Upon freight of whatever kind or description, not to exceed \$2 per ton; upon passengers, not to exceed \$5 each, as shall be from time to time determined by the



President: Provided, that no tolls shall be charged or collected upon freight or passengers carried to and landed at Ogdensburg, or any port west of Ogdensburg, and south of a line drawn from the northern boundary of the State of New York through the Saint Lawrence River, the Great Lake, and their connecting channels to the northern boundary of the State of Minnesota.

It has been suggest that if tolls are placed on the Welland Canal, the Americans would retaliate by using this legislation to impose tolls on the U.S. locks at Sault Ste. Marie, Michigan. These threats have not come from Americans, but from Canadian opponents of the increase.

The question of reciprocally unjust and unreasonable tolls is open to interpretation. However, the Canadian federal proposal does not in any way discriminate against the Americans, because the proposed toll increase would apply equally to all.

In summary, no legislation has been located which would prohibit or prevent a toll increase from being imposed on the Welland Canal. Canada is not taking unilateral action, but is negotiating the increase.

## FINANCIAL

### Introduction

In the same way as any other business venture, the survival of the Saint Lawrence Seaway depends on its economic circumstances, that is, on proper provision of the costs of upkeep, improvements, operation and maintenance.

This section is presented for information purposes only and relies completely on the published annual reports of the authorities concerned.

### General

Of the seven locks on the Montreal-Lake Ontario section, two are administered and operated by the St. Lawrence Seaway Development Corporation, the other five are in Canadian territory and under the responsibility of the St. Lawrence Seaway Authority.

As stated earlier, the special acts of parliament which authorized construction of the Seaway, charged both authorities with recovering the total capital outlay and the accumulated interest charges over a period of fifty years (due date, 2009).

In the case of the U.S. Corporation, this obligation was later changed with the passage of the 1970 Merchant Marine Act. As noted in the Legal section, this Act forgives all past, present and future interest payments on the original costs to the U.S. of building the Seaway. The Corporation can now, in effect, pay back the original construction debt with whatever is left over from its annual operations. The debt itself, however, has not been forgiven. Though the legislation guarantees that this debt will not grow, the Corporation is still compelled to repay it. This has created a new financial situation for the St. Lawrence Seaway Development Corporation, which is illustrated by the financial data in this section. Data are presented for 1969, one year before the passage of the Merchant Marine Act, and for 1974. Intervening and later years are also summarized.

In the Canadian case, the original obligation to repay the debt is still in force. Interest **has** to be repaid, however, not all of the interest has been paid. Since deferred interest payments themselves accumulate interest, the Authority has been placed in a situation where it is impossible for it to pay back its legal obligations.



If the proposal to convert the Canadian capital debt to equity, and forgive the outstanding interest became law, discussion of these debt items would become academic. As a consequence, the capital amounts in practice become a subsidy to users of the system.

The Saint Lawrence Seaway Authority, as stated earlier, is also responsible for the Welland Canal and the Canadian Lock at Sault Ste. Marie. Data on these sections are included.

The four American locks at Sault Ste. Marie are under a different jurisdiction (U.S. Army Corps of Engineers). Data on this section of the system have been omitted.

At the Beginning: 1954 - 1959 and Sixteen-Year Overview

Canadian and U.S. participation in the Seaway Project is revealed

by the initial debt of the two Authorities:		%
Canadian Construction Expenditure	\$332,500,000	72
U.S. Construction Expenditure	<u>\$132,500,000</u>	<u>28</u>
Total:	\$465,000,000	100

The following financial summary highlights the operations of each authority from 1960 to 1975. As above, dollar figures are Canadian and U.S. respectively. No discounting has been performed on these figures for either inflation or any other reasons, as the long term debt is a monetary obligation.

As has been stated by some of the users, the elimination of the capital debt would not lead to a financial loss in any sector of the economy. However, the historical progression of the total debt does indicate real outlays and financial costs which would have been incurred by any business undertaking and therefore would, if forgiven, constitute a subsidy to the users of this facility.

The U.S. forgiveness of the interest charges in 1970 shows immediately as a progressive decrease in the total debt of the facility. Such action corresponds effectively to assuming an opportunity cost of zero for the monies utilized for Seaway construction. Undoubtedly, within the competitive environment for resources in today's world, this is a considerable assistance to any group of users.

The transactions involving refinancing and recovery plans, from a social welfare point of view, should be analyzed in the complex environment of tradeoffs, direct and indirect benefits, social vs private returns, etc. The development of this argument falls outside the terms of reference of this study. It does not, however, fall outside the scope of the decision making which sets the financial policy guidelines that determine overall transportation policy.

The present federal proposal involves only a scheme to recoup yearly operating and maintenance expenses. Of special interest therefore, are the columns of the tables and the schedules which highlight yearly operating and maintenance costs.

As the Background section shows, the construction agreements between the two nations apply to the Lake Ontario-Montreal section of the St. Lawrence Seaway. Canada placed responsibility for the total Seaway in the hands of the St. Lawrence Seaway Authority whose traditional means of financing Welland expenditures and losses has been through parliamentary appropriation. The present practice, in so far as it covers financing of the Welland, is independent of any past Seaway history. This independence is only granted by the fact that the Montreal-Lake Ontario section has been able, up to now, to recoup its yearly costs from the toll revenues. With increasing costs and the inter-dependent nature of all the sections, it makes sense to view the system as a whole.

It is worth noting that on the Montreal-Lake Ontario section, the tolls have barely covered the operating costs in recent years.

The costs on the Welland suggests that similar toll structure to that on the St. Lawrence section would meet the costs.

The 1975 gross tons on the Welland section were 59.9 million. Applying a 40¢-toll to this tonnage yields \$23.96 million. This is approximately the expense of operating these locks in that year.



# Statement of income and expense for the year ended December 31, 1974

	Montreal-Lake Ontario Section		Welland Section		Total	
	1974	1973	1974	1973	1974	1973
<b>Income:</b>						
Tolls and lockage fees	\$15,596,770	\$20,390,412	\$ 3,194,280	\$ 4,249,800	\$18,791,050	\$24,640,212
Rentals	150,864	159,150	693,367	599,852	844,231	759,002
Wharfage	19,556	17,315	352,878	365,673	372,434	382,988
Interest	1,295,307	1,148,272	849,357	676,260	2,144,664	1,824,532
The Seaway International Bridge Corporation, Ltd. —net income (Note 2)	211,175	137,549	—	—	211,175	137,549
S.L.S. "Hercules"—heavy lift charges	134,350	134,396	—	—	134,350	134,396
Miscellaneous	237,178	175,795	276,859	340,902	514,037	516,697
	17,645,200	22,162,889	5,366,741	6,232,487	23,011,941	28,395,376
<b>Expense:</b>						
<b>OPERATION AND MAINTENANCE:</b>						
Salaries and wages (excluding \$27,836 charged to construction costs)	4,885,596	4,391,639	7,012,281	6,148,947	11,897,877	10,530,586
Employee benefits	594,768	537,885	882,529	758,503	1,477,297	1,296,388
Major maintenance materials and services	569,898	456,483	3,097,774	2,225,030	3,667,672	2,681,513
Grants in lieu of municipal taxes	83,019	86,139	702,412	713,476	785,431	799,615
Rental of traffic control equipment	—	—	302,040	319,370	302,040	319,370
Bridge operating services by railway companies	199,688	143,991	193,847	127,883	393,535	271,874
Security guards	232,226	227,568	—	—	232,226	227,568
Other materials and services	1,592,823	1,452,042	1,780,933	1,454,973	3,373,756	2,907,015
	8,158,018	7,285,747	13,971,816	11,748,182	22,129,834	19,033,929
<b>REGIONAL ADMINISTRATION:</b>						
Salaries and wages	1,183,974	991,144	984,813	878,548	2,168,787	1,869,692
Employee benefits	137,320	110,550	125,108	108,589	262,428	219,139
Office expenses	54,867	63,983	81,102	66,563	135,969	130,546
Travel and removal	17,916	19,713	23,121	16,758	41,037	36,471
Miscellaneous	81,532	197,038	149,452	113,147	230,984	310,185
	1,475,609	1,382,428	1,363,596	1,183,605	2,839,205	2,566,033
Less portion applicable to Non-Toll Canals	34,035	35,514	108,425	98,603	142,460	134,117
Construction costs	—	—	24,000	48,000	24,000	48,000
	34,035	35,514	132,425	146,603	166,460	182,117
	1,441,574	1,346,914	1,231,171	1,037,002	2,672,745	2,383,916
<b>HEADQUARTERS ADMINISTRATION (Schedule A)</b>						
Provision for doubtful accounts	2,665,142	2,576,528	3,406,377	3,331,381	6,071,519	5,907,909
	—	250,000	—	—	—	250,000
	2,665,142	2,826,528	3,406,377	3,331,381	6,071,519	6,157,909
	12,264,734	11,459,189	18,609,364	16,116,565	30,874,098	27,575,754
Net operating income (loss) before providing for interest and for replacement of machinery and equipment	5,380,466	10,703,700	(13,242,623)	(9,884,078)	(7,862,157)	819,622
Interest on loans from Canada	22,958,570	21,699,075	17,984,090	13,576,657	40,942,660	35,275,732
Other interest	—	—	487,019	—	487,019	—
Provision for replacement of machinery and equipment (Note 1)	1,068,881	1,088,833	—	—	1,068,881	1,088,833
	24,027,451	22,787,908	18,471,109	13,576,657	42,498,560	36,364,565
<b>Net loss for the year</b>	\$18,646,985	\$12,084,208	\$31,713,732	\$23,460,735	\$50,360,717	\$35,544,943

# Statement of income, expense and deficit for the 15 months ended March 31, 1976

(with comparative figures for the 12 months ended December 31, 1974)

St. Lawrence Seaway Authority

	Montreal-Lake Ontario Section	Welland Section	Non-Toll Section	TOTAL	
	1975/76 (15 months)	1975/76 (15 months)	1975/76 (15 months)	1975/76 (15 months)	1974 (12 months)
<b>Income</b>					
Tolls and lockage fees .....	\$ 16,540,671	\$ 3,746,851	\$ —	\$ 20,287,522	\$ 18,791,050
Interest and other .....	2,527,819	2,261,139	230,519	5,019,477	4,568,235
	19,068,490	6,007,990	230,519	25,306,999	23,359,285
<b>Expense</b>					
Operating expenses (Schedule A) .....	15,512,553	23,278,394	1,992,777	40,783,724	33,058,645
Interest on Government loans .....	31,819,584	22,661,597	—	54,481,181	40,942,660
Depreciation and write-off of capital assets .....	1,308,671	147,549	—	1,456,220	2,189,885
	48,640,808	46,087,540	1,992,777	96,721,125	76,191,190
<b>Loss for the period</b> .....	29,572,318	40,079,550	1,762,258	71,414,126	52,831,905
Add: Deficit at beginning of period .....	121,347,031	—	—	121,347,031	102,700,046
	150,919,349	40,079,550	1,762,258	192,761,157	155,531,951
Less: Recoveries from parliamentary appropriations	—	39,932,001	1,762,258	41,694,259	33,063,916
Transfer from contributed capital .....	—	147,549	—	147,549	1,121,004
<b>Deficit at end of period</b> .....	\$150,919,349	\$ —	\$ —	\$150,919,349	\$121,347,031

The accompanying notes are an integral part of the financial statements.

St. Lawrence Seaway Development Corporation.

STATEMENT OF FINANCIAL CONDITION AS OF  
DECEMBER 31, 1969 AND 1968

(Schedule A)

ASSETS

	December 31	
	1969	1968
PLANT, PROPERTY, AND EQUIPMENT:		
Plant in service, at cost (Schedule E and Note 1)	\$131,247,006	\$131,019,163
Less accumulated depreciation (Note 2)	15,308,740	13,654,559
Net plant in service	115,938,266	117,364,604
Work in progress	11,796	116,734
Total plant, property, and equipment	115,950,062	117,481,338
INVESTMENT IN AND LOANS TO SEAWAY INTERNATIONAL BRIDGE COMPANY:		
Promissory Notes	15,810	15,810
Debenture bonds—due December 31, 2012	7,440	7,440
Total investment in and loans to Seaway International Bridge Co.	23,250	23,250
CURRENT ASSETS:		
Cash	271,507	256,085
U.S. securities (Par) (Note 3)	1,131,445	—
Tolls and other receivables, net (Note 4)	124,942	139,434
Inventories, at cost	155,416	172,582
Total current assets	1,683,310	568,101
Total assets	\$117,656,622	\$118,072,689

INVESTMENT AND LIABILITIES

	December 31	
	1969	1968
INVESTMENT OF THE U.S. GOVERNMENT:		
Revenue bonds outstanding (authorized \$140,000,000)	\$133,476,050	\$129,076,050
Deferred interest during construction (Note 6)	6,706,437	6,706,437
Deferred interest during Operations (Note 6)	15,723,061	12,545,512
Total bond and interest debt	155,905,548	148,327,999
Deficit (Note 5)	—38,596,555	—31,146,398
Net Investment of U.S. Government	117,308,993	117,181,601
CURRENT LIABILITIES:		
Accounts payable	53,536	678,606
Accrued liabilities and deferred income	294,093	212,482
Total current liabilities (Note 7)	347,629	891,088
Total investment and liabilities	\$117,656,622	\$118,072,689

The Notes on page 19 are an integral part of this statement.



St. Lawrence Seaway Development Corporation.

COMPARATIVE STATEMENT OF FINANCIAL CONDITION  
AS OF DECEMBER 31, 1974 AND 1973

**Schedule 1**

**ASSETS**

	1974	1973
<b>PLANT, PROPERTY, AND EQUIPMENT:</b>		
Plant in service, at cost (Schedule 5 and Note 1) . . . . .	\$126,236,670	\$125,621,823
Less accumulated depreciation (Note 2) . . . . .	<u>22,570,738</u>	<u>20,943,330</u>
Net plant in service . . . . .	103,665,932	104,678,493
Work in progress . . . . .	<u>205,549</u>	<u>142,305</u>
Total plant, property, and equipment . . . . .	<u>103,871,481</u>	<u>104,820,798</u>
 <b>INVESTMENT IN SEAWAY INTERNATIONAL BRIDGE COMPANY:</b>		
Debenture bonds—due December 31, 2012 . . . . .	<u>7,440</u>	<u>7,440</u>
 <b>CURRENT ASSETS:</b>		
Cash (Note 3 and Note 5) . . . . .	3,646,306	2,913,025
Time deposits in minority banks (Note 4) . . . . .	740,000	600,000
Tolls and other receivables (net) . . . . .	432,245	395,522
Inventories, at cost . . . . .	<u>202,431</u>	<u>192,220</u>
Total current assets . . . . .	<u>5,020,982</u>	<u>4,100,767</u>
Total assets . . . . .	<u><u>\$108,899,903</u></u>	<u><u>\$108,929,005</u></u>

**INVESTMENT AND LIABILITIES**

<b>INVESTMENT OF THE U.S. GOVERNMENT:</b>		
Revenue bonds outstanding		
(Authorized \$140,000,000, unissued \$6,200,000) . . . . .	\$120,476,050	\$121,076,050
Deficit (Note 6) . . . . .	<u>- 12,654,335</u>	<u>- 12,997,014</u>
Net investment of U.S. Government . . . . .	<u>107,821,715</u>	<u>108,079,036</u>
 <b>CURRENT LIABILITIES:</b>		
Accounts payable . . . . .	12,920	15,796
Accrued liabilities and deferred income (Note 5) . . . . .	<u>1,065,268</u>	<u>834,173</u>
Total current liabilities (Note 7) . . . . .	<u>1,078,188</u>	<u>849,969</u>
Total investment and liabilities . . . . .	<u><u>\$108,899,903</u></u>	<u><u>\$108,929,005</u></u>

The notes on page 15 are an integral part of this statement.

St. Lawrence Seaway Development Corporation.

COMPARATIVE STATEMENT OF REVENUES AND EXPENSES  
FOR THE CALENDAR YEARS 1974 AND 1973

**Schedule 2**

**REVENUES**

	1974	1973
Seaway tolls . . . . .	\$5,768,970	\$7,541,456
Other . . . . .	212,554	197,955
Total revenues . . . . .	<u>\$5,981,524</u>	<u>\$7,739,411</u>

**EXPENSES**

Operations (Schedule 6) . . . . .	\$3,122,191	\$2,757,993
General administration (Schedule 7) . . . . .	827,191	722,623
Depreciation (Note 2) . . . . .	1,689,463	1,674,471
Total expenses . . . . .	<u>5,638,845</u>	<u>5,155,087</u>
Net gain for the year . . . . .	<u>\$ 342,679</u>	<u>\$2,584,324</u>

COMPARATIVE STATEMENT OF DEFICIT  
AS OF DECEMBER 31, 1974 AND 1973

**Schedule 3**

	1974	1973
Deficit at beginning of year . . . . .	\$12,997,014	\$15,581,338
Gain (-) or loss for the year . . . . .	- 342,679	- 2,584,324
Total Deficit at end of year . . . . .	<u>\$12,654,335</u>	<u>\$12,997,014</u>

STATEMENT OF SOURCE AND APPLICATION OF FUNDS  
FOR CALENDAR YEAR 1974

**Schedule 4**

**SOURCE**

Revenues:	1974
Seaway tolls . . . . .	\$5,768,970
Other . . . . .	212,554
Proceeds from property disposals . . . . .	12,675
	<u>\$5,994,199</u>

**APPLICATION**

Acquisition of assets . . . . .	\$ 752,821
Operations expenses . . . . .	3,949,382
Retirement of revenue bonds (U.S. Treasury) . . . . .	600,000
Increase in working capital . . . . .	691,996
	<u>\$5,994,199</u>

The notes on page 15 are an integral part of these statements.

SIXTEEN YEAR STATISTICAL SUMMARY OF THE ST. LAWRENCE SEAWAY AUTHORITY.  
Selected financial data

MONTREAL - LAKE ONTARIO (1)	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Finance (in millions of \$)																(15 MOS.)
Toll Revenue	7.2	8.1	8.9	10.7	13.5	15.5	17.3	16.4	18.1	15.6	18.6	20.0	20.0	20.4	15.6	16.6
Other Revenue	.1	.1	.3	.6	.6	.6	1.0	.9	1.2	1.2	1.3	2.2	1.4	1.8	2.0	2.5
Total Revenue	7.3	8.2	9.2	11.3	14.1	16.1	18.3	17.3	19.3	16.8	19.9	22.2	21.4	22.2	17.6	19.1
Expenses	2.9	3.1	3.7	4.1	4.1	4.4	5.2	6.0	6.7	7.6	8.5	10.4	11.7	12.8	13.7	15.5
Net Operating Profit	4.4	5.1	5.5	7.2	10.0	11.7	13.1	11.3	12.6	9.2	11.4	11.8	9.7	9.4	3.9	3.6
Interest	11.5	12.8	13.9	14.8	15.5	15.8	16.4	16.7	17.2	17.8	18.8	19.8	20.6	21.7	23.0	31.8
Loss for the Year	7.1	7.7	8.4	7.6	5.5	4.1	3.3	5.4	4.6	8.6	7.4	8.0	10.9	12.3	19.1	28.2
Accumulated Losses	9.1	16.8	25.2	32.3	38.3	42.4	45.7	51.1	55.7	64.3	71.7	79.7	90.6	102.9	122.0	150.2
Total Debt at End of Year	(2) 300.9	321.5	337.5	357.1	363.3	371.3	375.8	384.2	390.6	399.0	409.3	419.0	430.7	443.4	465.3	496.0

WELLAND	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Finance (in millions of dollars)																
Toll or Lockage Charge revenue	1.3	1.5	.6	-	-	-	-	.9	1.8	2.5	3.5	4.3	4.3	4.2	3.2	3.7
Other Revenue	.8	.7	.8	.8	.9	.8	1.1	1.2	.9	1.1	1.2	1.3	1.7	2.0	1.2	2.3
Total Revenue	2.1	2.2	1.4	.8	.9	.8	1.1	2.1	2.7	3.6	4.7	5.6	6.0	6.2	5.4	6.0
Expenses	3.8	4.6	4.4	4.9	6.3	8.9	11.2	10.3	11.0	10.7	11.9	12.5	13.9	17.3	20.0	23.3
Net Operating Loss	1.7	2.4	3.0	4.1	5.4	8.1	10.1	8.2	8.3	7.1	7.2	6.9	7.9	11.1	14.6	17.3
Interest	1.2	1.5	1.8	2.1	2.6	.1	-	-	.7	.8	1.0	2.0	2.1	13.6	18.0	22.7
Loss for the Year	2.9	3.9	4.8	6.2	8.0	8.2	10.1	8.2	9.0	7.9	8.2	8.9	10.0	24.7	32.6	40.0
Capital Debt at Year-end	29.7	32.4	33.0	40.0	43.6	53.6	80.2	98.1	121.2	147.3	185.0	237.2	283.8	315.1	321.3	321.0

- 1) Annual figures incorporate all subsequent retroactive adjustments.
- 2) Debt equals borrowings plus deferred interest.
- 3) Welland Canal tolls were suspended on July 18, 1962. A lockage charge was introduced in 1967.
- 4. Covered by Parliamentary appropriations.

Source: St. Lawrence Seaway Authority Annual Reports.



THE ST. LAWRENCE SEAWAY DEVELOPMENT CORPORATION (U.S.)  
SIXTEEN YEAR SELECTED FINANCIAL SUMMARY (millions of dollars)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Revenues:	3.1	3.4	3.7	4.4	5.6	6.4	7.1	6.1	6.8	5.9	7.0	7.5	7.5	7.7	6.0	6.3
Expenses:																
Operating:	1.2	1.3	1.6	1.6	1.7	1.8	1.9	2.0	2.3	2.2	2.4	2.8	3.3	3.5	3.9	4.3
Interest:	4.1	4.4	4.5	4.7	4.8	4.9	5.0	5.1	5.5	5.9	-	-	-	-	-	-
Total:	5.3	5.7	6.1	6.3	6.5	6.7	6.9	7.1	7.8	8.1	N/A	N/A	N/A	N/A	N/A	N/A
Interest Deferred During Operations:	2.2	2.3	2.4	1.9	.9	.3	.2	1.0	1.0	3.1	-	-	-	-	-	-
Cumulative Total	2.2	4.5	6.9	8.8	9.7	10.0	9.8	10.8	11.8	14.9*	-	-	-	-	-	-
Payment to U.S. Treasury:	1.9	2.1	2.1	2.8	3.9	4.6	5.2	4.1	4.5	2.8	3.8	3.9	4.0	2.5	.6	2.0
Bond and Interest Debt:	128.9	132.5	135.5	138.6	140.4	141.7	142.0	143.3	148.3	155.9	131.5	127.6	123.6	121.1	120.5	118.5

\*Compounding actually brought this figure to 15.7 in 1969 which added to the interest deferred during construction (6.4) in 1969, made the total deferred interest of that date \$22.4 million.

Source: St. Lawrence Seaway Development Corporation, Annual Reports.

## COMPETITION

### General

The nature of the competition facing the Seaway from other transport modes arises from the type of cargo handled by the system, the origin and destination patterns of the movements, and commercial arrangements between the trading partners.

A complete rate evaluation of each competing route as well as of the capacity limitations and constraints on these routes could not be conducted due to a lack of time and manpower. The following material is based on the opinions of the company representatives interviewed, and on consultations with some other experts in the field.

The volume transported on the Seaway is sufficiently large that a complete shift from water could not occur without serious negative impacts on the rest of the transportation system. However, over long periods of time, transportation patterns can and do change if inherent advantages exist, or more favourable treatment is received by one mode as opposed to another.

In the view of the study team, any modal switch which might occur from the Seaway to other modes would have to be gradual to ensure that other shipments would not be adversely affected.

Prior to conducting interviews, arguments had been made by several users that they would switch a large amount of product from water to other modes

in the event of a toll increase because a rate advantage would be perceived. During the course of the interviews, no evidence was produced which could verify these claims.

The transportation rates quoted in the initial arguments were the transportation rates currently in effect. It is unlikely that a major traffic shift would leave transportation rates on the other modes unaffected. This is because of the increased costs associated with providing increased capacity on those modes. There is no evidence that modes competing with the Seaway have substantial underutilized capacity available.

Competing modes of transportation usually price their services in relation to price and service levels on other modes. Special rates can be and are negotiated in some cases, however water competition generally controls rail rates. It is the opinion of the authors that an increase in shipping costs would be met in most cases with a parallel price increase in the other modes.

There are two different ways that competition might affect the Seaway. The first is selective diversion, depending on the goods being carried. The second is the possibility of large-scale switches, such as would come about from transferring all goods indiscriminately to another mode.

Selective competition could occur on the following commodities in the manner described below.



- Grain
  - The West Coast (Vancouver-Port Rupert)
  - Export through the East Coast by rail, probably unit trains
  - Export through the Mississippi River System
  
- Coal
  - Substitution of Eastern U.S. coal for Western Canadian coal shipped by rail to Ontario
  - U.S. coal switching to rail mode (unit trains)
  - Switch of industrial location to avoid usage of the Seaway system
  
- Iron Ore
  - Eastern iron moving via U.S. Atlantic ports and U.S. railways to the Great Lakes Basin
  - Moving by unit train in Canada
  - Moving by unit train in the U.S.

Manufactured Iron and Steel - Diversion to all other modes of transportation.

Each of these alternatives has to be examined not only in light of the possible rates that would be offered in transporting a specific good, but also in light of other built-in constraints:

- capacity limitation of the mode
- handling limitations at shipping and receiving ends
- adequacy or reliability of service

Indiscriminate modal switches could occur if all the Seaway traffic was to move by rail on both sides of the border, or if the U.S. was to build a U.D. canal to bypass the Welland Canal, and expand the Erie Canal system to avoid the Seaway.

## Detailed Commentary

### 1) Backhaul

The importance of wheat and iron ore to Great Lakes shipping lies not only in the fact that these two commodities constitute the bulk of the tonnages handled, but that one constitutes a backhaul for the other.

From the point of view of ship economies, on average, operation of a ship has to return a certain revenue flow per time period to allow the operation to be profitable. The existence of a two-way haul reduces light travelling (the time when ship travels in ballast), and hence allows savings in shipping costs which are passed on to shippers.

If iron ore or grain were shifted to another mode, the costs of shipping the remaining commodity would increase not only by the amount of toll but also by the amount required to keep the remaining operation profitable. Thus, it is not inconceivable that the elimination of a backhaul could double the rates of the fronthaul.

For that reason, the estimation of probable shifts becomes doubly important and the lack of factual data frustrates accurate forecasts.

### 2) Transfer to all Rail

This possibility is ruled out because the tonnages involved are roughly the equivalent of what rail is handling right now in total in this corridor.

The possibility of duplicating the rail capacity now available on the Canadian side while keeping the level of transport rates constant, has to be ruled out as improbable.

On the U.S. side, northeastern railways have been in dire financial straits in the last few years. Railroads in the northeast have difficulty coping with present traffic. It is improbable that they could be competing with Seaway rates even if the latter increased by the proposed amounts.

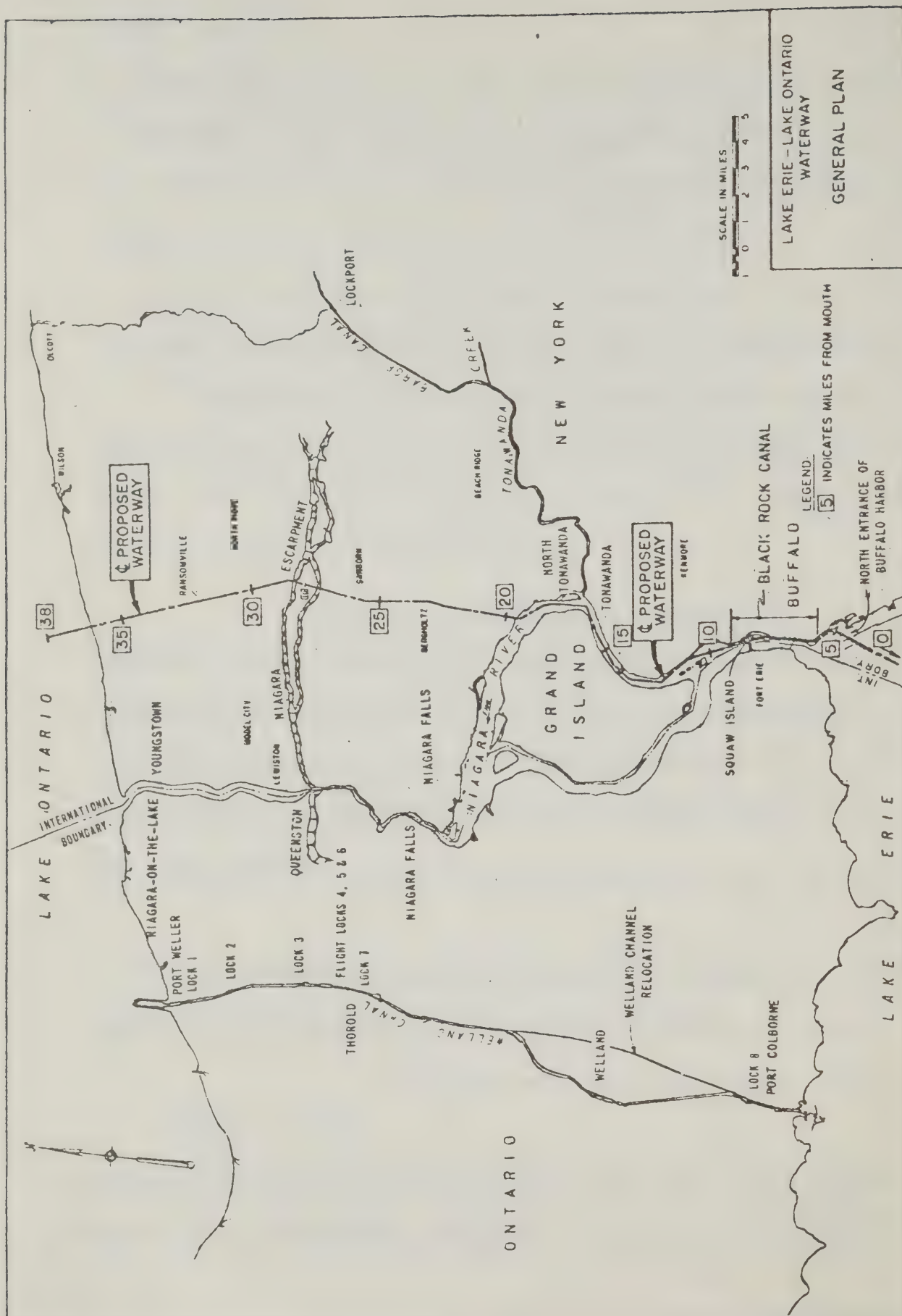
3) U.S. Construction of Alternative to Welland

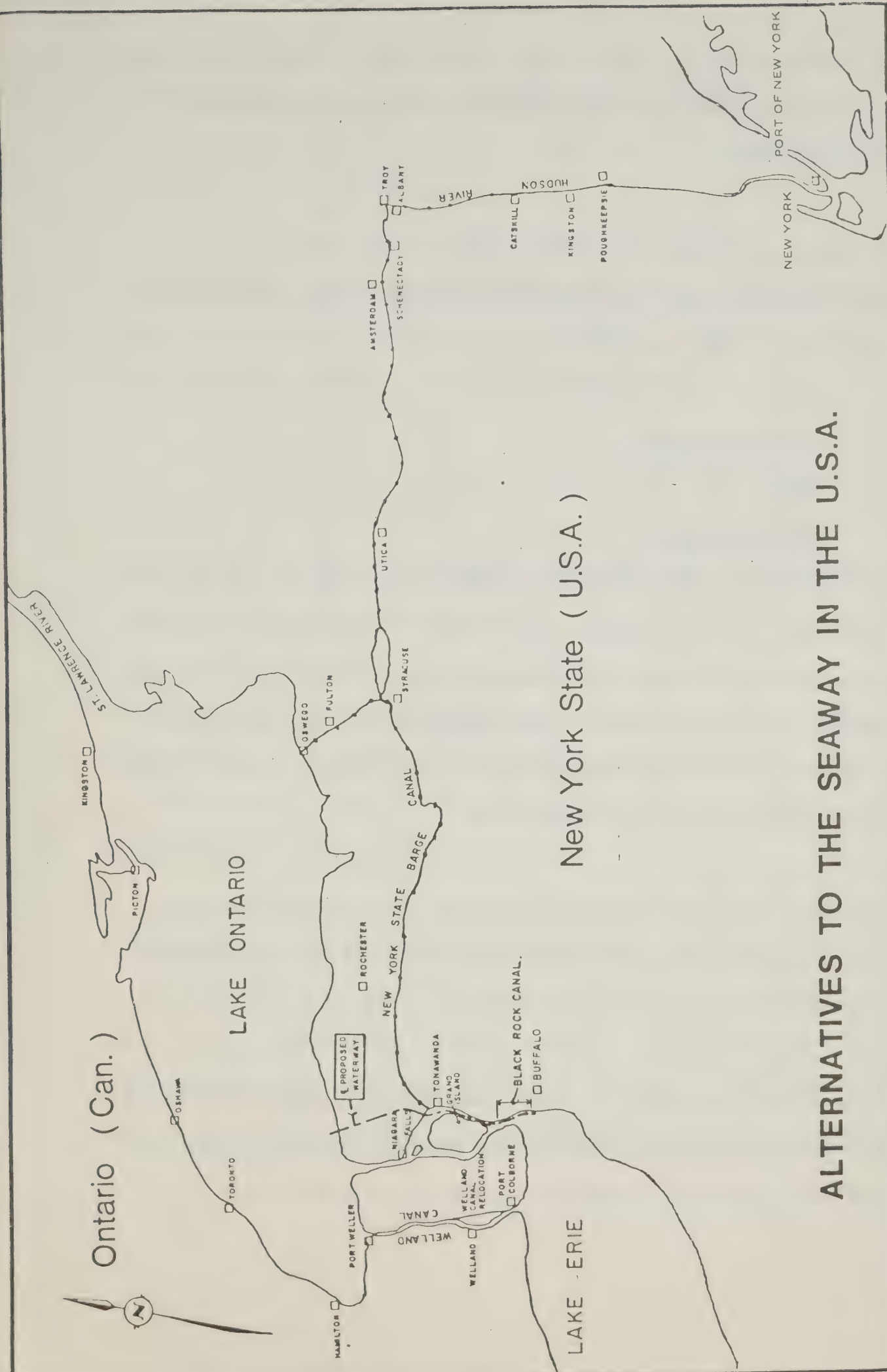
The U.S. senate has recently approved a \$1.5 million study to evaluate the feasibility of building a ship canal, entirely within the U.S.A. to bypass the Lake Erie-Lake Ontario crossing on the Welland, or to bypass the St. Lawrence Seaway completely, via the Hudson River down to the Atlantic. Maps of possible alternatives to these routes are included here.

It is interesting to note that the Welland Canal realignment cost the Canadian Government somewhere around \$240,000,000. The U.S. plans call for undertakings of at least a similar size.

The magnitude of the amounts that will be recouped from U.S. users under the proposed toll increases is certainly not comparable to the cost of building







New York State ( U.S.A. )

ALTERNATIVES TO THE SEAWAY IN THE U.S.A.

an alternative canal. Thus, if a new canal is built, it will not have been because of Welland Canal charges on U.S. users but for some entirely different reason.

In addition, President Carter's stated policy on cost recovery makes it less plausible to think that users of the alternative system would benefit from it at no direct cost to them.

4) Selective Transfers

a) Grain

i) West Coast Route

Transportation of grain depends essentially on the rates that the Canadian Wheat Board is able to negotiate with carriers. With respect to the rates negotiated with the Great Lakes shipping fleet, the Board's virtually monopolistic position in a situation where carriers are not allowed to collude, guarantees the board advantageous prices. This position is not as strong for the Board in the western negotiations.

The Great Lakes route however, is beset by problems other than tolls, chief among them the lack of year-round service and increased handling costs with respect to the western route.

In past years, the growth in western competition has implied that the cost watershed, from whence transport rates via either coast are the same, has gradually shifted east, proportionally reducing the eastern share.



The western terminals, however, especially Vancouver, are reaching their capacity limits and will soon run into shortages of grain elevators as well as of other handling facilities.

It is questionable whether the toll increase on the prairie tonnage handled through the Welland will cause large shifts of traffic, in light of the need to build additional capacity to service the western route.

It has to be kept in mind as well, that the Great Lakes Route serves as a competitive check on western ocean rates. Therefore, it is unlikely to be abandoned due to a marginal increase in costs as the rates on the other route might well be increased accordingly.

ii) Unit Train, East Coast, Year-Round

The possibility of unit trains to eastern ports is not realistic either, since the rate differential, even with the toll surcharge would not justify it (see Provincial Impacts Section).

Year-round service on the eastern route is guaranteed now by stockpiling grain in elevators at the Georgian Bay ports. These stocks are shipped by train to the east coast during the winter months. The cost differential of this service over the cost of Lake shipping is subsidized by the Government through "At and East" subsidy. The probable elimination of this subsidy by the

Minister of Transport, who is at the same time the chairman of the Wheat Board, does not reveal high concern about the danger that the Great Lakes route for wheat may collapse.

iii) Mississippi River System

Ocean rates from selected U.S. ports to Europe on the average are higher than from St. Lawrence Ports. However, ocean rates are volatile. Assuming that the toll increase makes it more profitable to ship through the Mississippi, whose rates are now comparable to the Seaway, a host of other decisions would have to be made. These include: relocation of some elevators, shipping to ports where grain could be loaded onto barges, as lakers cannot traverse this route, and wrestling with capacity limitations of the Mississippi system itself, such as lock and dam 26. It is even possible that the U.S. will end up charging tolls on parts of this system, with lock and dam 26 being the first candidate.

General

Steel prices have varied drastically in the past without producing significant traffic diversions. Ontario Hydro is receiving large tonnages of western coal, up to 50% more expensive at destination than U.S. coal because of transportation costs. This move is designed to boost the Canadian industry. Some of the mines are partly owned by the steel makers, so the possibility of switching sources is unlikely, especially considering that no other sources are competitive with respect to this movement.

These two concerns have, in the past, toyed with the concept of other transportation modes and their long term expansion programs might contain a different share mix for the inbound and outbound modes, if this is the case, it is unlikely that seaway tolls will have been the deciding factor.

b) Iron Ore

In the case of iron ore in Canada, Stelco, one of the largest users, does not have sufficient capacity at their plant to handle the affected tonnage with unit trains. Any modal shifts, from their point of view, would have to be long term changes involving significant capital investments.

In the case of iron ore, a toll on the Welland would have its greatest effect on the U.S. ports receiving eastern ore. The great majority of these ports are on or upstream of Lake Erie.

The tonnages coming to Hamilton from Sept Isles, Point Noire and Port Cartier would not be greatly affected as they do not come through the Welland. Hamilton, however, also receives ore from local mines up in the Lake Superior ore ranges. From the Canadian point of view it is possible that these tonnages could be rerouted to interlake traffic, with more traffic from the lower St. Lawrence going directly to Hamilton. However, the picture is not that simple, since vertical integration in ownership of mines, steel mills and even some of the transportation infrastructure forces certain patterns of distribution and movement. The time available for this study did not allow a detailed analysis of all the related aspects.

Reliance for drawing these conclusions has been placed exclusively on data by industry (see Provincial Impacts).

Alternatives such as shipping more Quebec and Labrador ore to Europe and concentration on Lake Superior Ranges for U.S. ports, or shipping to central U.S. steel mills via ports of Baltimore and Philadelphia are possibilities but their evaluation requires a study in itself.

c) Coal

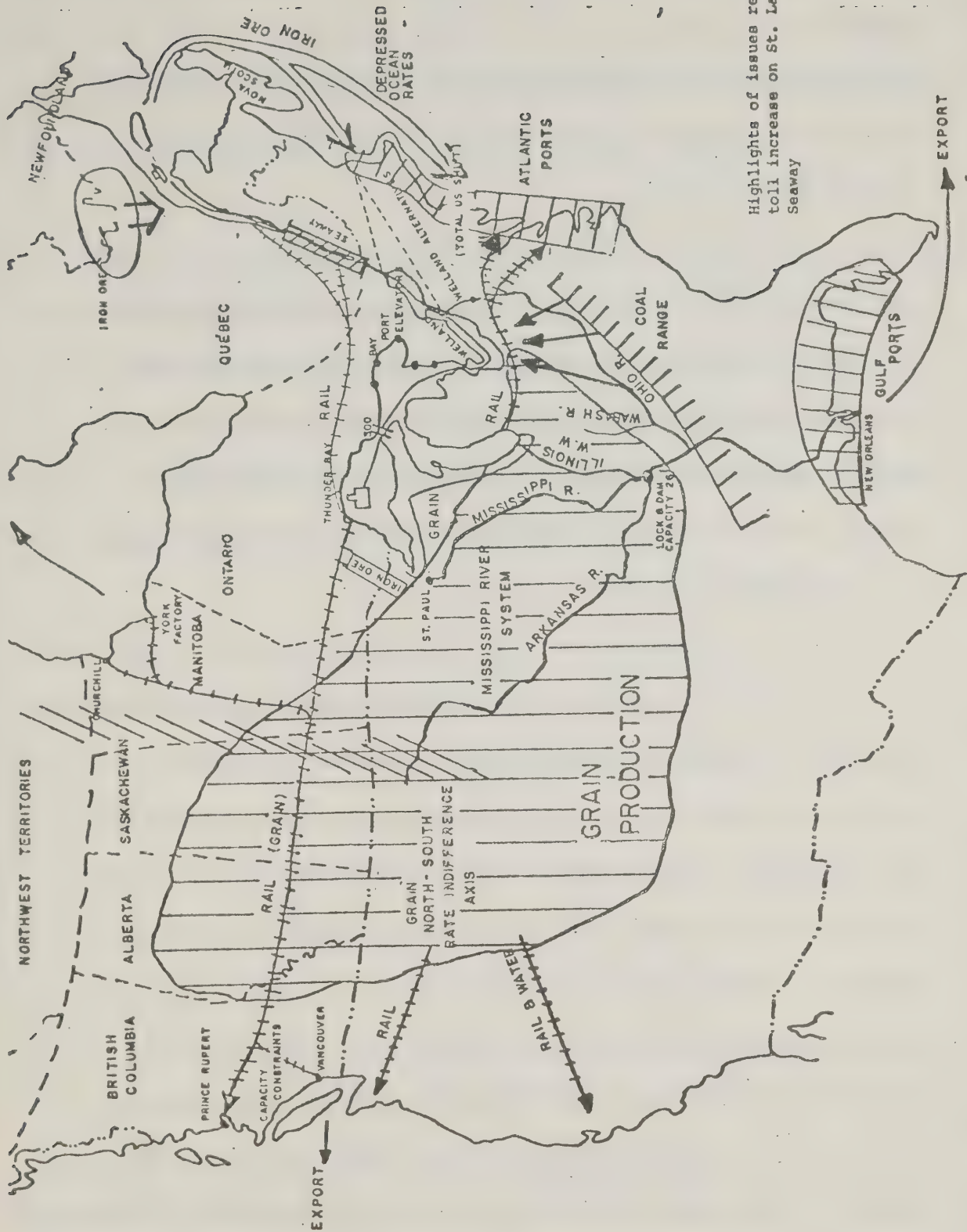
The coal traffic on the Welland, the third most important commodity in terms of tonnage handled by the system, mostly originates in the U.S. Lake Erie ports from the central U.S. coal ranges. It is destined to Canadian ports for steel plants and thermal electric generation.

The most important Ontario unloading ports are Nanticoke, Hamilton, Toronto-Lakeview and some points further east.

Nanticoke tonnages are mostly destined to Ontario Hydro. They do not use the Seaway, and hence, would not be affected. The shipments which require investigation are those routed to Hamilton and points further east. The Hamilton steel plants are captive to the water movement of coal at the present since they do not have adequate land or other capacity to handle the coal traffic in any other way. Plans for trucking or pipelining coal, say from Nanticoke, would be too expensive in comparison with the toll increase.



# GOODS PRODUCTION & TRANSPORTATION



## SELECTED PROBLEMS

### General

In order to place the St. Lawrence Seaway in perspective, comparison is made of the tonnages carried on the Seaway as opposed to those carried by other modes.

The Seaway however, cannot be thought of as a mode of transportation in itself. Though shippers, carriers and academics have constantly stressed arguments underlining the relative ton-mile output of one mode as opposed to another, every mode in today's transportation world, and the St. Lawrence Seaway in particular, is an integral link in a total pattern of service.

The description of this pattern involves the movement of a good from its initial place of origin to its final place of destination. The performance of this job is seldom carried out by a single mode of transportation but by a combination which usually involves collection of a load at the origin point, generally by lighter vehicles, transportation to a transshipment terminal, at which point the goods are loaded onto a vehicle which completes the line-haul or longest leg of the journey. The shipment is then again unloaded at some kind of transfer terminal, from whence it either leaves to distribution centres, is processed further or carried directly to the consuming centre. Hence, an important measure of the general efficiency of a mode has to do oftentimes with performance criteria applied to seemingly unrelated areas such as transfer points and linking transport modes. These issues are explored in more detail in the section on subsidies.

The aim of this section is to emphasize the relative size of the industry linked directly to the Seaway, describe the traffic patterns involved and discuss in some detail a few of the main commodities which are transported through the system.

The Seaway System is just a link, albeit important, of Great Lakes shipping. In 1976, tonnage carried through this system totalled 71.9 million, of which 31.5 million crossed the system upbound, versus 40.4 downbound.\* In the same year, the total tonnage carried by rail in Canada was 262,866,000, while other modes of transport carried: Highway - 110,000,000, Air - 470,000 and the total water mode handled 245,000,000 tons.\*\*

The trends in Seaway shipping and those in total Canadian shipping can be illustrated with the following charts.\*\*\*

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\* St. Lawrence Seaway Authority: Traffic Report 1976

\*\* Rail: Statistics Canada Transportations Division  
Other Modes: Estimates based on Statistics Canada data for 1975.  
Hwy. Mode: Only for hire included. This figure only an estimate  
by Statistics Canada

\*\*\* CTC: Transport Review: Trends and Selected Issues - Ottawa, February 1977  
pp. 34 and 37.

# CARGO AND FREIGHT AND TON-MILES BY MODE OF TRANSPORTATION

Cargo and Freight Mode	'000 Tons Loaded						Billion Ton-Miles				
	1971	1972	1973	1974	1975		1971	1972	1973	1974	1975
Air <sup>(1)</sup> Domestic	278	292	333	333	352		0.20	0.23	0.22	0.24	0.26
	29	29	32	35	36		0.03	0.03	0.03	0.04	0.04
	43	62	60	67	63		0.16	0.20	0.22	0.23	0.24
TOTAL	350	382	425	435	451		0.39	0.44	0.47	0.51	0.54
Rail Domestic	184,474	184,623	210,015	211,990	200,163						
	51,936	53,287	55,931	59,526	48,939						
TOTAL	236,410	237,910	265,946	271,516	249,102		118.56	123.66	130.76	138.66	135.09
Road <sup>(2)</sup> Domestic			101,306	100,170			N/A	N/A	21.63	33.74	N/A
Transborder	N/A	N/A	N/A	N/A	N/A						
Water <sup>(3)</sup> Domestic	60,768	60,987	60,973	59,120	59,936						
	166,554	177,476	196,645	183,896	183,227						
TOTAL	227,322	238,463	257,618	243,016	243,163		78.92	79.32	89.43	84.38	84.42
Pipeline Domestic											
& Transborder		N/A					59.42	70.50	82.50	79.10	66.40
Oil											
Domestic &							31.71	36.42	42.00	43.68	44.88
Transborder Gas											

(1) Includes mail & excess baggage

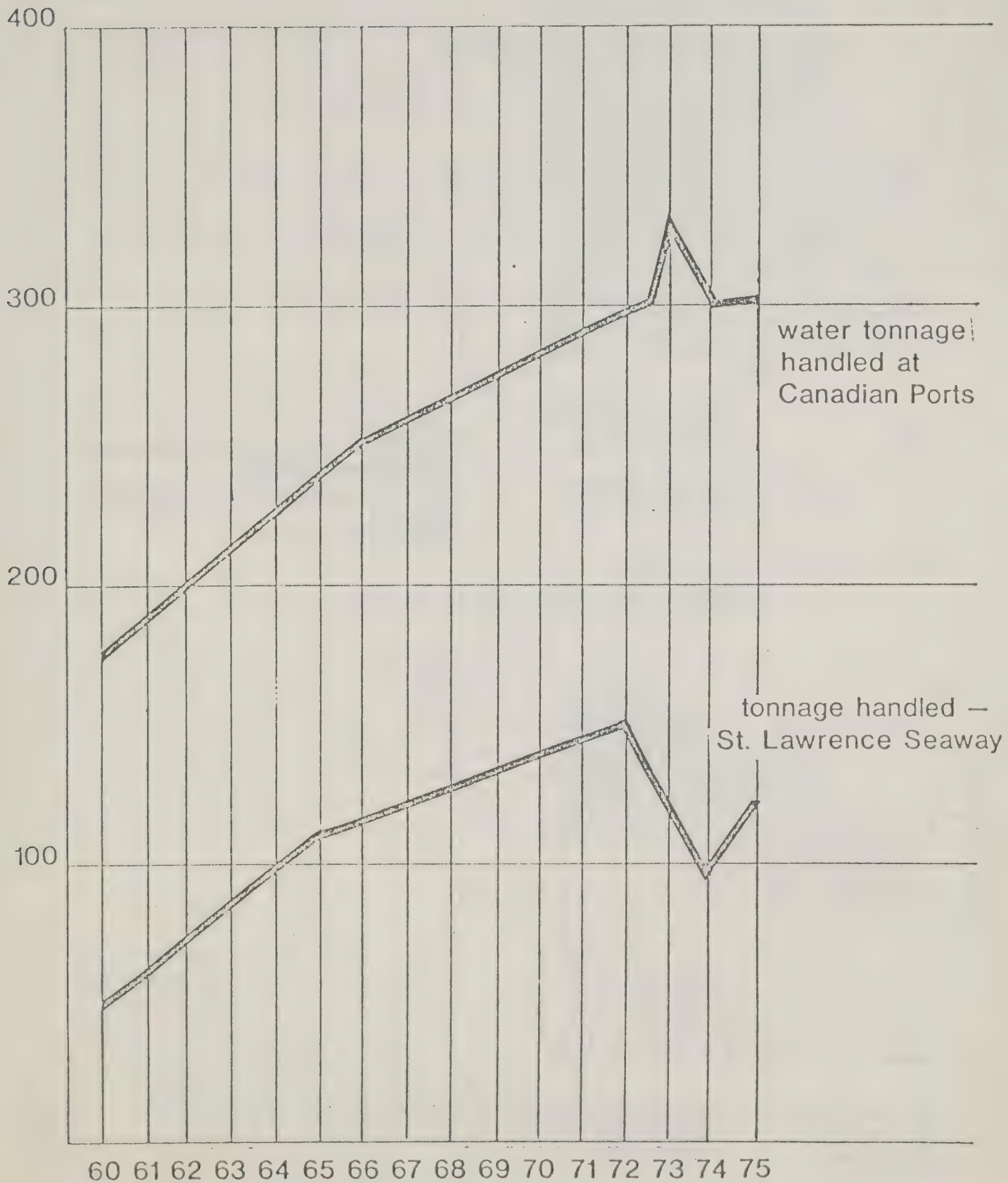
(2) Excludes trips of carriers earning less than \$100,000 and excludes trips of less than 15 miles

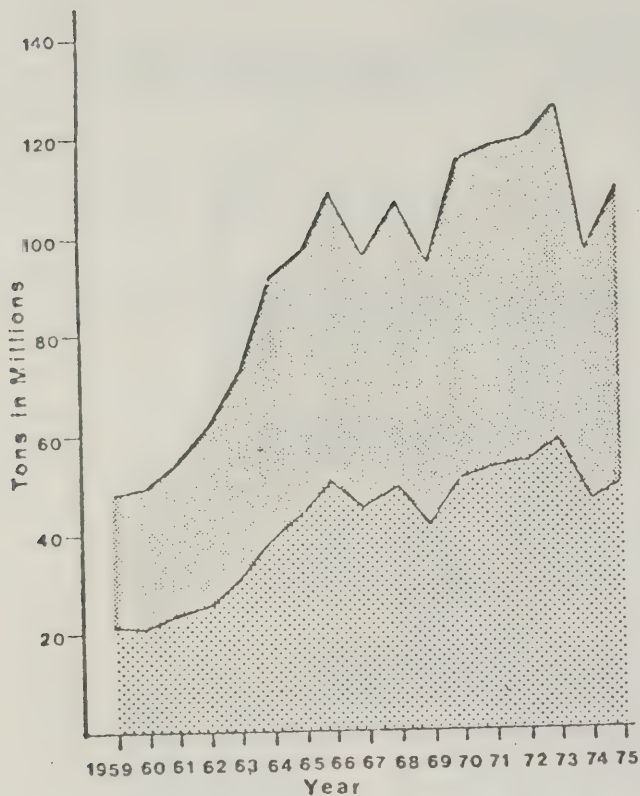
(3) Ton-miles for water are estimated on basis of tons loaded.

Statistics Canada  
Transportation and  
Communications  
November 1976



# WATER CARGO TONNAGES HANDLED AT CANADIAN PORTS AND ST. LAWRENCE SEAWAY, 1960-1975



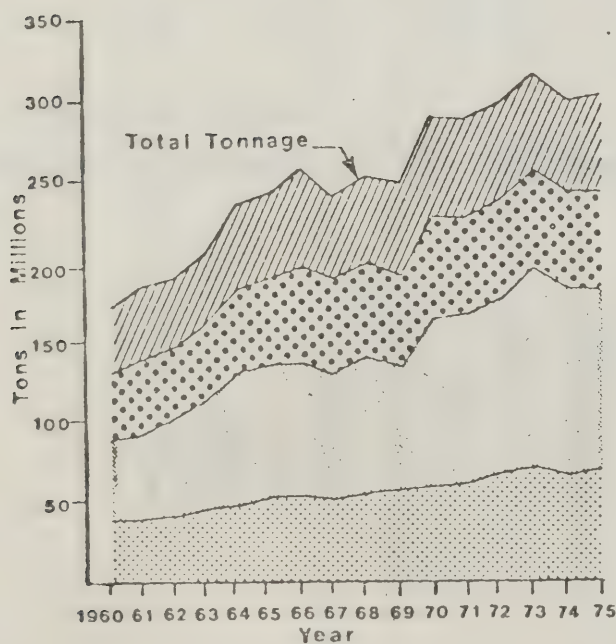


Welland Montreal-Lake Ontario

Source: Traffic Report of the  
St. Lawrence Seaway Authority  
and the St. Lawrence Seaway  
Development Corporation

Canadian Transport Commission  
Transport Review  
Trends and Selected Issues  
Ottawa  
February 1977

Cargo Tonnage Handled at Canadian  
Ports: 1960-1975



International Unloaded International Loaded  
Domestic Unloaded Domestic Loaded

Source: Statistics Canada Catalogues Nos.  
54-003, 54-203, 54-204 and  
54-206

## Carriers

For 1976, of the total 48.3 million tons of commodities transiting the Montreal-Lake Ontario section, 38.0 million were moved by ships of Canadian registry, while U.S. registered ships moved only 1.9 million; the remaining volume was moved by ships of foreign registration.

The Welland Canal section presents similar proportions with 43.9 million tons moving in Canadian bottoms, 1.4 in U.S. bottoms and the balance of the 62 million tons in ships of foreign registration.

The significance of the Seaway, for the Great Lakes shipping industry, can be established from the following quote from Darling and Shaw's report on Lake Shipping.\* (p.32).

### "5. THE ST. LAWRENCE SEAWAY AND LAKE SHIPPING

The St. Lawrence Seaway is the largest single factor responsible for the structure of the Canadian lake shipping industry as it appears today. The Canadian industry is by far the largest user of the St. Lawrence Seaway and the Welland Canal. American lake shipping has remained concentrated in the Upper Lakes leaving only the ocean ships to share the waterway with the Canadian carriers. The following extract from Table 7 indicates the extent to which the Seaway is used for the main commodity movements.

<u>DMA Traffic</u> <u>using</u>	<u>Percent of Tonnage</u>	<u>Percent of</u> <u>Revenue</u>
St. Lawrence and Welland	41	51
Welland only	26	18
St. Lawrence only	10	17
Neither canal	23	14 "

\* H.J. Darling & G.C. Shaw, The Canadian Shipping Industry Today.  
U of T, York University Joint Program in Transportation. RR#29, 1975.

\*\* Dominion Marine Association.

This section provides a commentary on some of the problems which are facing water movements on the Great Lakes.\*

Though water is relatively the most energy efficient mode and has the lowest linehaul costs for long distances, it has limited flexibility and requires large capital expenditures to provide suitable handling equipment and transfer terminals. There are considerable right-of-way maintenance costs, such as dredging, etc. In most cases, water does not provide service from origin to destination, it has to interline with other competing modes. These have as a consequence been able to erode its competitive ability.

The trends in water shipping have favoured increased size of vessels and hence a reduction in the number of trips necessary to transport a given volume of commodities. As a consequence, recouping costs of operation requires very complex planning involving collection of loads and scheduling of trips in such a way as to minimize empty travelling time. Low costs are obtained at the cost of sacrificed flexibility. This pattern of shipments implies that the rates for all goods are interconnected and interdependent.

A large portion of the Great Lakes fleet is Seaway specific and cannot be operated anywhere else.

The shipping season is not year-round. This creates stockpiling problems that some potential customers prefer to avoid by using other modes.

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\* The reader is referred to two excellent sources on the problem. One is the above report by Darling and Shaw, the other is by D. Wm. Carr and Associates, The Seaway in Canada's Transportation, An Economic Analysis. Ottawa, Oct. 170, 2 Vols.



The Federal ship building subsidy programs are being phased out, and carriers face a host of longer term uncertainties among which labour costs, the impacts of new port legislation, the imposition and cost of pilotage, are but a few.

#### Types of Cargo

The goods carried on the Seaway are for the most part bulk commodities, with iron ore, grain and coal constituting the largest tonnages.

The following table gives a complete description of the goods transiting the Seaway in 1976.

COMBINED TRAFFIC BY CLASSIFICATION AND TYPE OF CARGO - TRAFIC COMBINÉ SELON LA CLASSIFICATION ET LE GENRE DE CARGAISON  
MONTREAL-LAKE ONTARIO AND WELLAND CANAL SECTIONS<sup>(2)</sup> - SECTIONS DE MONTREAL AU LAC ONTARIO ET DU CANAL DE WELLAND<sup>(2)</sup>

(Cargo Tons - Tonnes de cargaison)

1976

St. Lawrence Seaway

Voie maritime du Saint-Laurent

Commodity Dénrée		Bulk Vrac	General Général	Total Total	% of Total du total
					\$
Wheat	Blé	10,143,255	-	10,143,255	14.1
Corn	Maïs	4,723,624	-	4,723,624	6.6
Rye	Seigle	139,760	-	139,760	.2
Oats	Avoine	728,577	-	728,577	1.0
Barley	Orge	3,451,022	-	3,451,022	4.8
Flour, Wheat	Farine de blé	30,453	-	30,453	(1)
Flour, Edible, Other	Autres farines alimentaires	14,575	168	14,743	(1)
Soybeans	Fèves de soya	1,640,248	-	1,640,248	2.3
Soybean Oil Cake and Meal	Tourteaux de soya et farine de tourteaux de soya	96,686	-	96,686	.1
Beans and Peas	Haricots et pois	185,566	-	185,566	.3
Malt	Malt	94,768	-	94,768	.1
Flaxseed	Graine de lin	157,724	-	157,724	.2
Other Agricultural Products	Autres produits agricoles	933,066	24,333	957,399	1.4
AGRICULTURAL PRODUCTS - TOTAL - PRODUITS AGRICOLES		22,344,324	24,501	22,368,825	31.1
Packing House Products, Edible	Produits comestibles du conditionnement de la viande	54,394	2,048	56,442	.1
Hides, Skins and Pelts	Cuir, peaux et fourrures	-	42,574	42,574	.1
Other Animal Products	Autres produits d'origine animale	110,832	55,499	166,331	.2
ANIMAL PRODUCTS - TOTAL - PRODUITS D'ORIGINE ANIMALE		165,226	100,121	265,347	.4
Bituminous Coal	Houille grasse	7,620,844	-	7,620,844	10.6
Coke	Coke	2,012,716	-	2,012,716	2.8
Iron Ore	Minerai de fer	24,619,594	-	24,619,594	34.3
Aluminum Ore and Concentrates	Minerai et concentrés d'aluminium	52,343	-	52,343	.1
Clay and Bentonite	Argile et bentonite	276,409	196	276,605	.4
Gravel and Sand	Gravier et sable	324,506	-	324,506	.5
Stone, Ground or Crushed	Pierre broyée ou concassée	1,095,659	-	1,095,659	1.5
Stone, Rough	Pierre brute	3,575	-	3,575	(1)
Petroleum, Crude	Pétrole brut	-	-	-	-
Salt	Sel	1,669,715	-	1,669,715	2.3
Phosphate Rock	Roche phosphatée	39,955	-	39,955	(1)
Sulphur	Soufre	48,217	-	48,217	.1
Other Mine Products	Autres produits miniers	800,886	15,978	816,864	1.1
MINE PRODUCTS - TOTAL - PRODUITS MINIER		38,564,419	16,174	38,580,593	53.7
Pulpwood	Bois à pâte	-	-	-	-
Other Forest Products	Autres produits forestiers	29,920	52,785	82,705	.1
FOREST PRODUCTS - TOTAL - PRODUITS FORESTIERS		29,920	52,785	82,705	.1
Gasoline	Essence	332,509	-	332,509	.5
Fuel Oil	Mazout	2,051,154	-	2,051,154	2.8
Lubricating Oils and Greases	Huiles et graisses lubrifiantes	210,293	284	210,577	.3
Petroleum Products, Other	Autres dérivés du pétrole	272,121	246	272,367	.4
Rubber, Crude, Natural, Synthetic	Caoutchouc brut, naturel ou synthétique	5,919	8,331	14,250	(1)
Chemicals	Produits chimiques	455,152	33,999	499,151	.7
Sodium Products	Produits sodiques	123,364	5,814	129,178	.2
Tar, Pitch and Creosote	Goudron, poix, brai et créosote	52,325	112	52,437	.1
Pig Iron	Fente en gueuse	137,701	-	137,701	.2
Iron and Steel, Brrs, Rods, Slabs	Fer et acier en barres, verges ou brames	-	303,578	303,578	.4
Iron and Steel, Nails, Wire	Fer et acier: clous et fil	-	55,665	55,665	.1
Iron and Steel, Manufactured	Fer ou acier usiné	5,169	2,987,906	2,993,075	4.2
Machinery and Machines	Machines	3,448	102,890	106,338	.1
Cement	Ciment	182,531	-	182,531	.2
Woodpulp	Pâte de bois	77,815	-	77,815	.1
Newsprint	Papier journal	-	48,295	48,295	.1
Syrup and Molasses	Sirups et mélasses	43,843	15	43,858	.1
Sugar	Sucre	350,661	-	350,661	.5
Food Products	Produits alimentaires	48,529	62,397	110,926	.2
Scrap Iron and Steel	Ferrailles de fer et d'acier	511,082	-	511,082	.7
Other Manufactures and Misc. (3)	Autres produits fabriqués et divers (3)	1,016,182	749,617	1,765,799	2.4
MANUFACTURES AND MISC. - TOTAL - FABRICATIONS ET PRODUITS DIVERS		5,889,798	4,359,149	10,248,947	14.3
Package Freight - Domestic	Caissage - Intérieur	296,737	-	296,737	.4
Package Freight - Foreign	Caissage - Extérieur	-	-	-	-
PACKAGE FREIGHT - TOTAL - CAISSAGES		296,737	-	296,737	.4
GRAND - TOTAL - GLOBAL		67,290,474	4,552,730	71,843,204	100.0

(1) Less than .05%.

(2) Represents total Seaway traffic eliminating duplications between the two sections.

(3) Includes Unclassified Cargoes.

(1) Moins de .05%.

(2) Représente le trafic total dans la Voie maritime en éliminant la duplication entre les deux sections.

(3) y compris les cargaisons non classifiées.

Source: The St. Lawrence Seaway Authority and the St. Lawrence Seaway Development Corporation: Traffic Report of the St. Lawrence Seaway, 1976, p.5.

PRINCIPAL COMMODITIES SHIPPED ON THE ST. LAWRENCE

SEAWAY SYSTEM

Year Commodities	Lake Ontario-Montreal Section				
	1972 %	1973 %	1974 %	1975 %	1976 %
Iron Ore	23.4	27.2	32.4	30.2	37.7
Wheat	19.9	19.8	19.5	25.8	17.3
Man.Iron & Steel	10.1	6.5	6.8	3.8	5.5
Barley	8.3	6.1	3.8	5.1	6.0
Corn	6.8	6.8	6.4	6.8	8.3
Fuel Oil	6.0	6.5	4.5	4.1	2.8
% of Total Traffic	74.5	72.9	73.4	75.8	77.6
	Welland Canal Section				
	%	%	%	%	%
Iron Ore	21.4	25.6	28.5	27.5	33.5
Wheat	17.2	17.7	17.7	21.9	14.9
Bituminous Coal	15.5	12.2	12.4	14.2	11.5
Man. Iron & Steel	7.7	5.0	5.2	2.7	4.1
Barley & Corn	13.0	11.8	9.4	10.1	12.8
Soya Beans	3.0	2.9	2.7	2.9	2.6
% of Total Traffic	77.8	75.2	75.9	79.3	79.4

Source: St.Lawrence Seaway Authority  
Traffic Reports

## Grain

Grain, which in this analysis includes wheat, barley, corn and other products, is the second largest tonnage transported on the seaway. The marketing and transportation of grain products are the end links in a complex chain of economic activity which would need several hundred pages to describe in full. The following is a brief sketch of some of the elements that make up this activity.

The flow of grain through the St. Lawrence is downbound and comprises to a large extent export grain although not all of it is exported directly. Both the U.S. and Canada use the St. Lawrence Seaway System for grain movements. In the U.S., private farms or consortia control the movements of grain, but in Canada the decision as to what gateway to use for which part of the production rests mostly in the hands of the Canadian Wheat Board. In Canada, there exist several routes for grain exports, in order of importance, they are the following:

- Pacific or western ports route: Vancouver and Prince Rupert, via rail and transferred from elevators onto ocean-going vessels;
- St. Lawrence Seaway route: Ex-Thunder Bay to St. Lawrence port elevators, thence to ocean-going vessels;  
Ex-Thunder Bay to Georgian Bay port elevators, railed to lower St. Lawrence port elevators and transferred to ocean ships;



- Ex-Thunder Bay directly on ocean-going vessels;
- Rail from Prairies to Churchill elevators thence to ocean-going ships or in the future to York Factory on Hudson Bay and to ocean vessels. This route is undergoing some expansion and improvements at the present.
- Direct unit trains to Atlantic - lower St. Lawrence ports;
- Gulf route via the Mississippi River system, this latter one being only a possible route at the present.

For the U.S., the patterns are even wider with shipments via the Mississippi, rail movements to Pacific ports, St. Lawrence Seaway or railed to Atlantic ports.

As can be seen, grain movements use any and all of the transportation routes subject to, among other constraints, economically convenient rates. Though in the States an association as powerful as the Wheat Board does not exist, rate advantages and economy of transportation routes are insured in many instances by corporate vertical integration. Some consortia have interests in or directly own railway equipment, elevators, barges and ships, thus being able to route grains to those ports with the most favourable ocean rates.

For countries such as the U.S. and especially Canada, the production, movement, processing and export of grain is a major economic activity. The transport system in Canada, particularly in the Prairie provinces has developed with the vagaries and the changes of the foreign grain markets. The intricacies of movement patterns have repercussions in transportation vehicle development, port location and planning, seasonal utilization of transportation infrastructure, and impact on the life styles of whole communities sometimes thousands of miles distant from the growing centres.

Within the whole framework of grain subsidies, the toll issue is a minor element. Its repercussions cannot be examined without taking the whole system into consideration. This is beyond the purpose of this report. What can be said with certainty though, is that this item of federal planning will not mean a drastic change in patterns of movement, given that the Seaway is not a marginal but a principal artery for the movement of grain bound for overseas markets. In the opinion of the authors, the changes contemplated are quite within the range of magnitude of day to day price and cost changes faced by the industry.

Having stated this, some cautions must be raised. Although it is unlikely that large shifts will occur across the spectrum of products included under this heading, certain shifts and some implications are of serious concern to operators and shippers:

- Some specialized areas of operations require further analysis. Examples are the soya beans and meal producers who depend exclusively on the Seaway for their operation, and who compete in an environment where tariff, quota restrictions and price regulation makes diversion or price increases impossible. These operations were established in a framework of tolls which allowed for their operation. Changes in the framework might put them out of business altogether. These cases should be studied with great care.

The use of Mississippi system as an alternative to the Seaway could:

- a) end up costing the users, through user charges, what it costs the government to maintain and operate the system, especially if it is resolved to update Lock and Dam 26 (see Map) and if President Carter implements user charges on inland waterways. In this case it might be advantageous for the Canadian and U.S. governments to agree on strategies for the timing of implementation of tolls.
- b) continue to be free, in which case the U.S. taxpayer will be subsidizing that traffic which is diverted from the seaway.

Movement of Grain Through the St. Lawrence Seaway System  
Montreal - Lake Ontario Section

Wheat	(tons)					
	Total	%	Upbound	%	Downbound	%
1970	8,180,997	16.0	-	-	8,180,997	31.6
71	7,411,085	17.8	-	-	7,411,085	35.0
72	10,666,485	19.9	-	-	10,666,485	38.0
73	11,417,199	19.8	-	-	11,417,199	38.2
74	8,602,052	19.5	-	-	8,602,052	40.7
75	12,414,483	25.8	-	-	12,414,483	47.6
76	9,387,929	17.3	-	-	9,387,929	36.7
<u>Barley</u>						
1970	3,980,605	7.8	-	-	3,980,605	15.3
71	3,789,541	7.2	-	-	3,789,541	14.1
72	4,438,979	8.3	-	-	4,438,979	15.8
73	3,536,135	6.1	-	-	3,536,135	11.8
74	1,656,167	3.8	-	-	1,656,167	7.8
75	2,460,219	5.1	-	-	2,460,219	12.3
76	3,260,869	6.0	-	-	3,260,869	12.8
<u>Corn</u>						
1970	2,883,661	5.6	-	-	2,883,661	11.1
71	3,385,705	6.4	-	-	3,385,705	12.6
72	3,628,496	6.8	-	-	3,628,496	12.9
73	3,922,792	6.8	-	-	3,922,792	15.1
74	2,838,537	6.4	-	-	2,838,537	13.4
75	3,205,486	6.8	-	-	3,205,486	12.3
76	4,522,888	8.3	-	-	4,522,888	17.7
<u>Soya Beans</u>						
1970	2,483,273	4.9	-	-	2,483,273	9.6
71	2,905,384	5.5	28	-	2,905,356	10.8
72	1,609,843	3.0	-	-	1,609,843	5.7
73	1,656,316	2.9	-	-	1,656,316	5.5
74	1,012,578	2.3	-	-	1,012,578	4.8
75	1,275,812	2.7	-	-	1,275,812	4.4
76	1,211,296	2.2	-	-	1,211,296	4.7

Source: St. Lawrence Seaway Authority: Traffic Reports



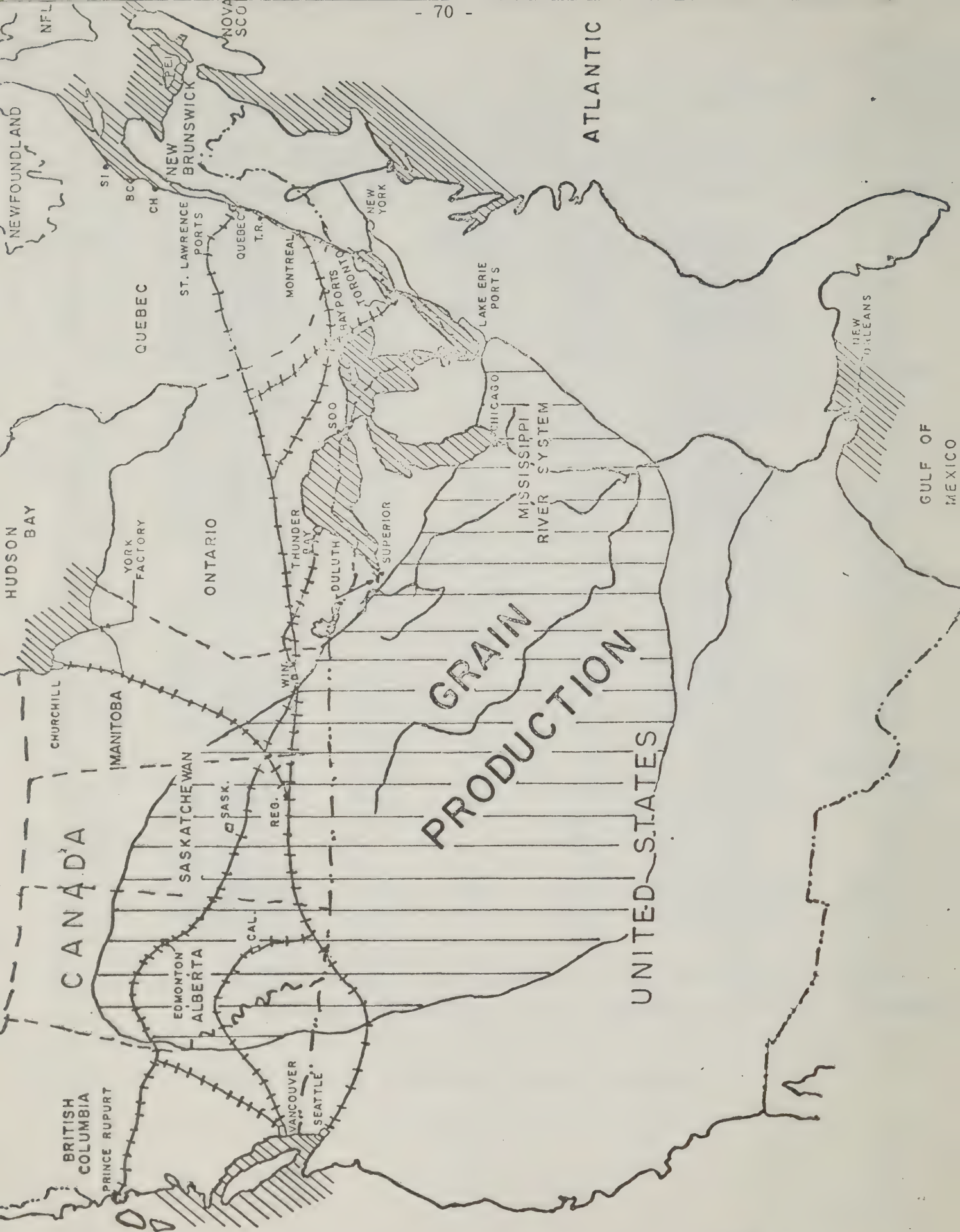
Movement of Grain Through the St. Lawrence Seaway System

Welland Section

Wheat	Total	%	(tons)		%	Downbound	%
			Upbound				
1970	8,685,972	13.8	4,300	-	-	8,681,672	20.8
71	9,772,097	15.5	-	-	-	9,772,097	23.6
72	11,030,456	17.2	-	-	-	11,030,456	25.7
73	11,892,334	17.7	-	-	-	11,892,334	27.3
74	9,243,803	17.7	21,765	-	-	9,222,038	28.6
75	13,087,648	21.9	-	-	-	13,087,648	31.9
76	9,575,258	14.9	-	-	-	9,575,258	24.8
<u>Barley</u>							
1970	4,226,927	6.7	-	-	-	4,226,927	10.1
71	4,170,686	6.6	-	-	-	4,170,686	10.1
72	4,463,592	7.0	-	-	-	4,463,592	10.5
73	3,652,879	5.5	-	-	-	3,652,879	8.4
74	1,875,644	3.6	-	-	-	1,875,644	5.8
75	2,585,346	4.3	-	-	-	2,585,346	6.3
76	3,438,643	5.4	-	-	-	3,438,643	8.9
<u>Corn</u>							
1970	3,039,899	4.8	-	-	-	3,039,899	7.3
71	3,533,073	5.6	-	-	-	3,533,073	8.5
72	3,818,190	6.0	-	-	-	3,818,190	8.9
73	4,183,610	6.0	-	-	-	4,183,610	9.6
74	3,013,302	5.8	-	-	-	3,013,302	9.3
75	3,444,515	5.8	-	-	-	3,444,515	8.4
76	4,723,624	7.4	-	-	-	4,723,624	12.2
<u>Soya Bean</u>							
1970	2,958,930	4.7	-	-	-	2,958,930	7.1
71	3,297,276	5.3	-	-	-	3,297,276	8.0
72	1,960,111	3.0	-	-	-	1,960,111	4.6
73	1,967,480	2.9	-	-	-	1,967,480	4.5
74	1,423,723	2.7	-	-	-	1,423,723	4.4
75	1,717,820	2.9	-	-	-	1,717,820	4.2
76	1,639,725	2.6	-	-	-	1,639,725	4.2

Source: St. Lawrence Seaway Authority: Traffic Reports

PACIFIC

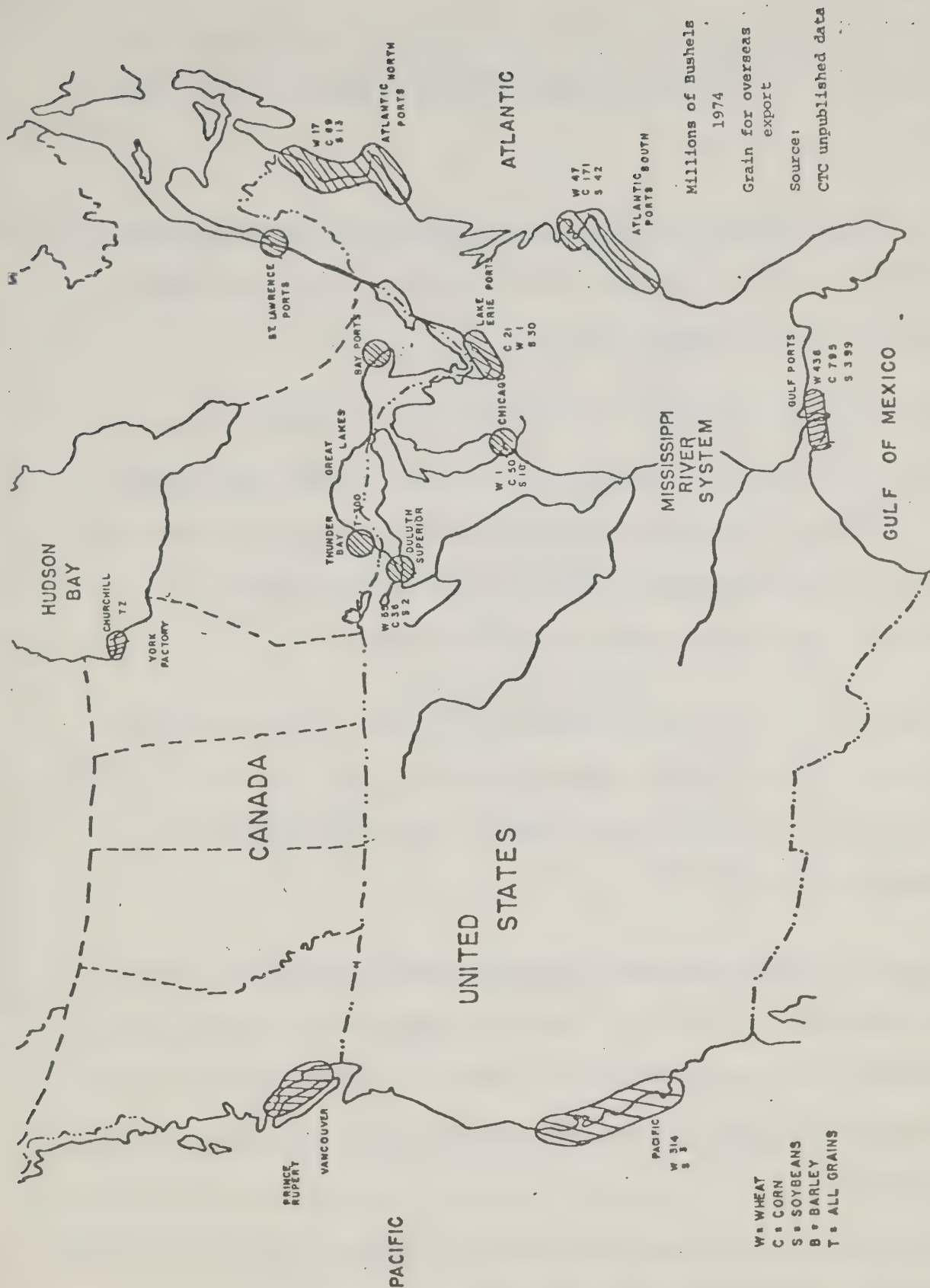


# GRAIN PRODUCTION AND DISTRIBUTION

# MAIN TRANSPORT CORRIDORS FOR EXPORT GRAIN INFRASTRUCTURE

Rail routes in the U.S. not shown.

# SELECTED GATEWAYS FOR GRAIN EXPORTS





Coal\*

Coal (Bituminous) is the third largest tonnage in terms of seaway use, being 10.6% of total tonnage shipped. If coke is added, the total goes up to 13.4% of seaway use.

Most of the 27.8 million tons produced in Canada were mined in British Columbia, Alberta, Saskatchewan and Nova Scotia with 12.9 million being exported directly, mostly to Japan.

16.5 million tons is imported to Canada of which 99% comes from the Appalachian region of the eastern United States. Of this, approximately 8.2 million was imported for thermal power generation use in Ontario and 8.2 for coke making purposes most of which is used by Stelco and Dofasco at their Hamilton plants for steel production.

Ontario Hydro is the largest Canadian user of coal. In the past Ontario Hydro was almost completely dependent on U.S. coal. However, long term contracts have recently been concluded for some large tonnages to be shipped from Alberta.

The main centre of coal usage for Ontario Hydro is the thermal power generation plant in Nanticoke. Most of the thermal coal is shipped from Ashtabula, Conneaut and Sandusky to either the plant at Nanticoke or the thermal plant on Lake Ontario. The Alberta thermal coal usually terminates at Nanticoke.

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\*Sources:      Energy Mines and Resources  
                  SLSA Traffic Report, 1975  
                  Statistics Canada  
                  CTC various publications and unpublished data.



The metallurgical coal used by Stelco and Dofasco originates in U.S. mines.

The following are the coal movements on the Seaway system in 1976.\*

<u>Montreal-Lake Ontario Section</u>					
	UP Tons	% Total Up	Down Tons	% Total Down	Total Tons
Bituminous	187,191	.7	194,210	.8	381,401
Coke	<u>1,065,208</u>	<u>3.7</u>	<u>720,958</u>	<u>2.8</u>	<u>1,786,166</u>
	1,252,399	4.4	915,168	3.6	2,167,567

<u>Welland Canal Section</u>					
Bituminous	-	-	7,433,653	19.2	7,433,653
Coke	<u>1,061,348</u>	<u>4.1</u>	864,326	2.2	<u>1,925,674</u>
	1,061,348	4.1	8,297,979	21.4	9,359,327

Thus, the most significant use of the system in connection with coal arose from metallurgical use at Hamilton.

The statistics presented here do not describe the situation today in 1977, but the changes involve mostly growth in tonnages. In addition, Ontario Hydro is receiving a much larger share of Canadian coal via Thunder Bay.

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\* From: St. Lawrence Seaway Authority & St. Lawrence Seaway Development Corporation. Traffic Report of the St. Lawrence Seaway.

Movement of Coal Through the St. Lawrence Seaway System

Montreal - Lake Ontario Section

(tons)

Year	Total	%	Upbound	%	Downbound	%
1970	317,761	.6	-	-	317,761	1.2
71	330,153	.6	-	-	330,153	1.2
72	269,164	.5	-	-	269,164	1
73	277,667	.5	-	-	277,667	.9
74	193,116	.5	-	-	193,116	.9
75	190,792	.9	-	-	248,562	1.0
76	187,191	.7	-	-	194,210	.8

Welland Section

Year	Total	%	Upbound	%	Downbound	%
1970	10,714,033	17.1	-	-	10,714,033	25.7
71	9,198,272	14.6	-	-	9,198,272	22.3
72	9,929,123	15.5	-	-	9,929,123	23.1
73	8,139,388	12.2	-	-	8,139,388	18.7
74	6,483,941	12.4	-	-	6,483,941	20.1
75	8,488,700	11.5	-	-	8,488,700	20.7
76	7,433,653	11.6	-	-	7,433,653	19.2

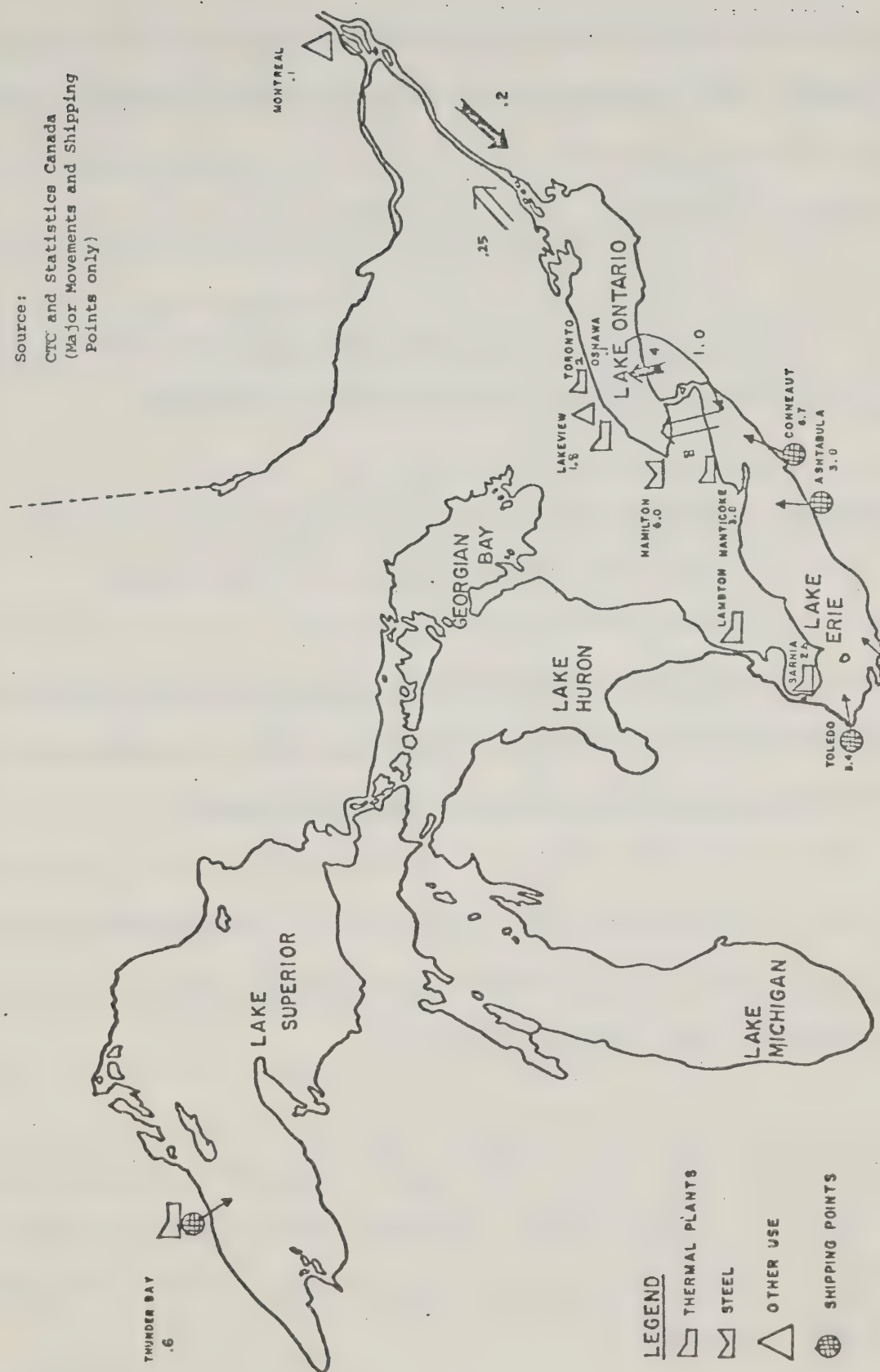
Source: St. Lawrence Seaway Authority: Traffic Reports

## BITUMINOUS COAL SHIPMENTS &amp; USE IN CONNECTION WITH SEAWAY

1975. Figures in millions of short tons.

**Source:**

CTC and Statistics Canada  
(Major Movements and Shipping  
Points only)



## Iron Ore

Iron ore constitutes the largest single commodity tonnage moved through the seaway. Most of the iron ore is brought from mines in Labrador and Quebec via ports such as Sept Isles, Pointe Noire and Port Cartier. It is destined to steel plants in Hamilton and U.S. ports on Lake Erie.

Also, a significant amount of iron ore is mined in the iron ranges local to Lake Superior and shipped downbound, mainly to Hamilton.

The Canadian production of iron ore in 1975 was 50 million short tons. Of these, 21.5 million were shipped on the St. Lawrence Seaway.

Through the Montreal-Lake Ontario section upbound, 14.5 million tons of iron ore constituted 66.1% of the upbound traffic and 15,242 tons moved downbound through the same section (.1% of downbound traffic).

The Welland Canal iron ore traffic upbound was 12.3 million tons (64.8% of the upbound traffic) and 4.2 million tons were shipped down for a total of 16.5 million tons moved through this section.

The production of iron ore in Canada is controlled largely (over 70%) by U.S. concerns although there are also some European companies holding equity in ore production (over 3%). The remaining 25-26% is in the hands of Canadian companies.



Stelco and Dofasco have equity in the Lake Superior ore ranges thus making their demand from this region fairly stable and less elastic to small changes in their shipping rates.

Major capacity expansion projects have been completed in the ore mining sector, largely in the Quebec-Labrador area in the recent years. However, the steel plants are very cautious about their own expansion programs as the world wide slump in steel makes future prospects very risky. Companies in Canada face fierce competition and the fact that the industry they compete against is in some cases subsidized does not help their long term planning.\*

The steel industry of the U.S., most of which operates with outdated plant, is now faced with very low steel prices worldwide. Questions have been raised about the ability of this industry to continue to survive in the long run. Since the U.S. steel makers load large volumes on the Seaway, the precarious position in which they find themselves, which makes them very price sensitive, has an impact on the future of the entire Seaway.

No first hand discussions were held with the U.S. Steel Industry. The only material available to the authors for analysis were the submissions of the industry to the U.S. hearings on toll increases. Conclusions from these submissions are judgemental and cannot be supported by incontrovertible fact. However, from these submissions, a degree of doubt has been raised on the effect of toll increases on the overall traffic balance in the St. Lawrence System, and thus, the strength of the case for increasing tolls is undermined.

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\* Source for much of the production data: Dept. of Energy, Mines and Resources.

Movement of Iron Ore through the St. Lawrence Seaway System

Montreal-Lake Ontario Section

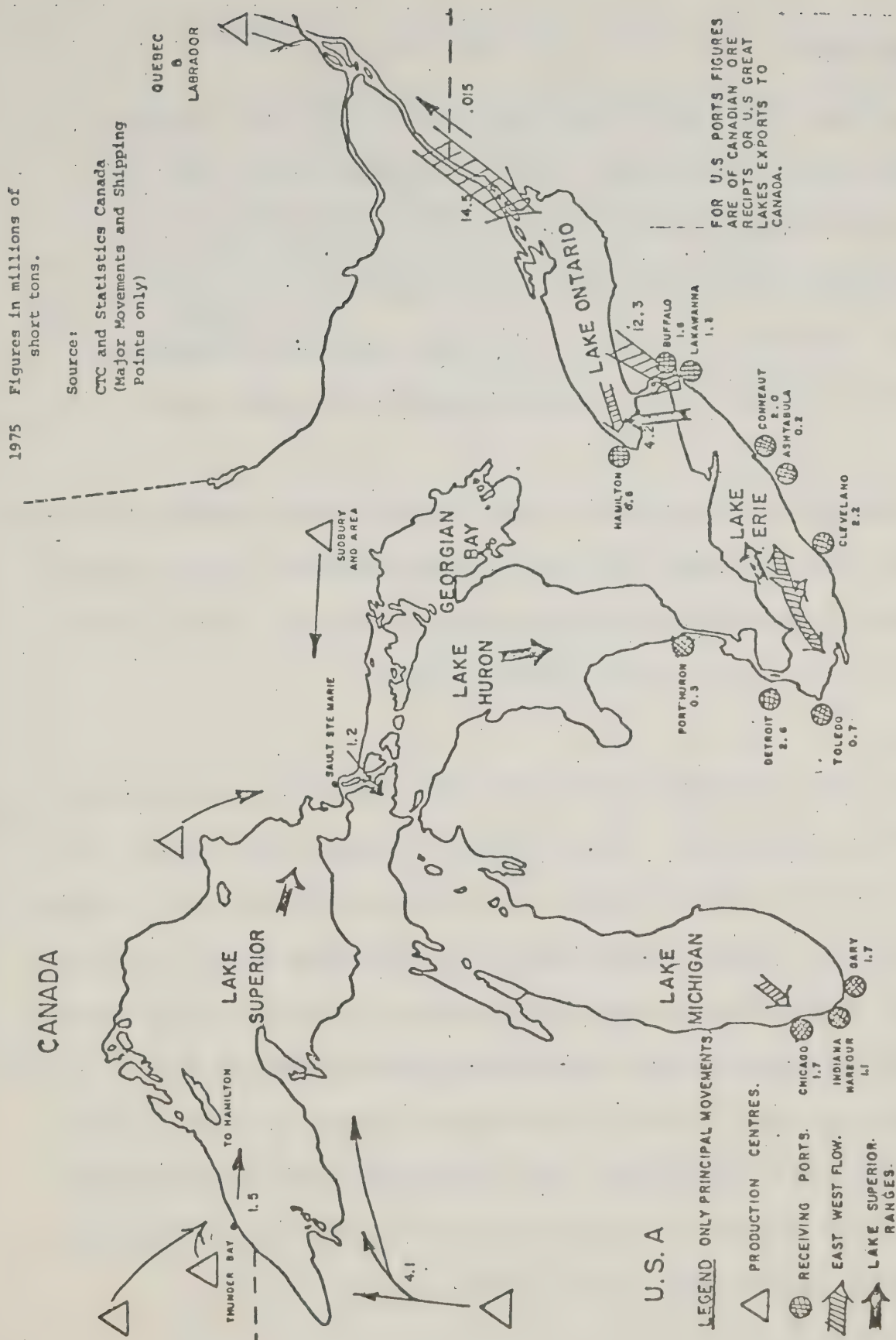
Year	Total	%	Upbound	%	Downbound	%
1970	15,111,537	29.6	14,809,650	58.7	308,887	1.2
71	13,427,449	25.4	13,427,449	15.6	-	-
72	12,533,408	23.4	12,533,408	49.3	-	-
73	15,691,569	27.2	15,691,569	56.8	-	-
74	14,291,462	32.4	17,291,462	62.1	-	-
75	14,505,669	30.2	14,490,427	66.1	15,242	-
76	20,835,312	27.7	20,535,312	71.2	-	-

Welland Section

Year	Total	%	Upbound	%	Downbound	%
1970	16,091,198	25.6	12,524,799	59.3	3,566,399	8.5
71	13,566,990	21.6	10,772,198	49.9	2,794,792	6.8
72	13,732,088	21.4	10,640,634	50.4	3,091,454	7.2
73	17,183,362	25.6	13,321,644	56.2	3,861,718	8.9
74	14,913,659	28.5	11,846,427	58.9	3,067,232	9.5
75	16,468,942	27.5	12,261,089	64.8	4,207,853	10.3
76	21,549,627	33.5	17,970,396	70.0	3,579,231	9.2

Source: St. Lawrence Seaway Authority: Traffic Reports

# ORE PRODUCTION & SHIPMENTS IN CONNECTION WITH SEAWAY USE



### Other Goods

Apart from grain, iron ore and coal, there are many other commodities which move in the Seaway. There was insufficient time in this study to explore the nature of the operations behind the transportation of each commodity, or the specific problems that might arise from any change in tolls. Statistics are included for two other commodities, Manufactured Iron and Steel, and Salt. These are regarded as extreme cases.

Manufactured Iron and Steel is a high valued commodity relative to transportation costs. It is safe to say that patterns of movement would be dictated mainly by considerations other than price of movement. Demand patterns, service, etc., make up the main considerations.

Salt on the other hand is a very low priced commodity and very sensitive to transportation costs. Any cost structure changes might induce a shift in consumer - producer patterns with reroutings from one centre to another. Preliminary analysis indicated that not all the changes would be disruptive since the resulting movement pattern might show more economy of movement. This case requires further analysis as do the very sensitive areas of cement, stone and gravel. These last commodities could end up suffering severe impacts from a toll increase. Such impact might not be unemployment or production reduction, it may just result in locational shifts. It was clear, however, that the topic requires specific analysis.



Over the years, tonnages on the Seaway have shifted to bulk commodities. Special cargo such as package freight has been losing importance. It is conceivable that the toll increase could mean the end of this service on the seaway. If so, a brief special analysis of the impact of this termination of service should be undertaken as time did not allow consideration of this element in sufficient detail.

Movement of Manufactured Iron and Steel Through the  
St. Lawrence Seaway System  
Montreal - Lake Ontario Section

Year	Total	%	(tons)	%	Downbound	%
			Upbound			
1970	3,982,271	7.8	3,389,881	13.4	592,390	2.3
71	5,787,741	10.9	5,575,102	21.4	212,639	.8
72	5,333,410	10.1	4,944,680	10.5	588,730	1.4
73	3,723,202	6.5	3,479,299	12.6	243,903	0.8
74	2,991,938	6.8	2,765,573	12.0	226,365	1.1
75	1,837,147	3.8	1,683,623	7.7	153,524	0.6
76	2,086,702	5.5	2,503,036	8.7	483,666	1.9

Welland Section

	Total	%	Upbound	%	Downbound	%
1970	3,716,576	5.9	3,282,554	15.5	434,022	1.0
71	5,567,003	8.9	5,328,713	24.7	249,792	.6
72	4,897,691	7.7	4,635,610	21.9	262,081	.6
73	3,425,347	5.0	3,267,074	13.8	158,273	.4
74	2,707,994	5.2	2,538,725	12.6	169,269	.5
75	1,633,447	2.7	1,550,334	8.2	83,113	.2
76	2,659,889	4.1	2,430,798	9.5	229,091	.6

Source: St. Lawrence Seaway Authority: Traffic Reports

Movement of Salt Through the St. Lawrence Seaway System  
Montreal - Lake Ontario Section

Year	Total	%	(tons) Upbound	%	Downbound	%
1970	463,918	.9	143	-	463,775	1.8
71	510,110	1.0	-	-	510,110	1.9
72	889,173	1.7	46,902	.2	842,215	3.0
73	799,782	1.4	71,851	.4	727,981	2.4
74	894,927	2.0	-	-	894,927	4.2
75	859,315	1.7	21,762	.1	837,553	3.2
76	829,329	1.5	13,420	.1	815,409	3.2

Welland Section

Year	Total	%	Upbound	%	Downbound	%
1970	1,082,966	1.7	23	-	1,082,943	2.6
71	1,187,845	1.9	-	-	1,187,845	2.9
72	1,623,310	2.5	-	-	1,623,310	3.7
73	1,529,827	2.3	-	-	1,529,827	3.5
74	1,549,689	3.0	-	.1	1,549,689	4.8
75	1,494,853	2.5	21,762	-	1,473,091	3.6
76	1,661,715	2.6	5,920	-	1,655,795	4.3

Source: St. Lawrence Seaway Authority: Traffic Reports

## PROVINCIAL IMPACTS

### General

The imposition of a higher toll level on the St. Lawrence Seaway system will result in higher charges to the marine carriers, and through them, to the shippers. Theoretically, these costs could be high enough to force some shippers to switch transportation modes. The St. Lawrence Seaway system is the passageway to the Great Lakes and all the Canadian Ports on the lakes are in Ontario. Thus whatever the implications of a higher toll level, these are certain to affect Ontario. The aim of this section is to determine the nature and extent of the impact of increased tolls on the Province.

A direct shipper and carrier survey was undertaken to establish and evaluate possible impacts of the increase in tolls. What little rate analysis is presented here has been included as a confirmation of opinions formed through direct contact with the concerned parties. Time did not allow for any quantitative models or forecasts. The conclusions of this section are based on the findings in the rest of this study and on the responses of the users of the system. Special mention is made of those areas where it is felt that further research is required.

### Questionnaire

Broad questionnaires were designed for shippers and for carriers to find out the facts pertinent to a toll increase (included as Appendix 1). These questionnaires were either mailed or personally handed to the official the



company had named as working contact for this project. In addition, a personal interview with the working contact was carried out by members of the Ministry in all but a few cases, where the contacts indicated that a phone conversation was sufficient. At these interviews, the purpose of this study, as well as the precise toll increase plan proposed by the Federal Government, were detailed. All parties were asked for their opinions regarding toll increases and were given complete freedom to change the format of the questionnaire in whatever way they thought was the most relevant for stating their particular problems.

The list of people interviewed is the following:

<u>Carriers</u>	<u>Head Office</u>
1. Algoma Central Railway, Sault Ste. Marie, Ontario.	
2. Canada Steamship Lines (1975) Limited, Montreal, P.Q.	
3. Quebec and Ontario Transportation Co. Ltd., St. Catharines, Ont.	
4. Scott Misener Steamships Limites, ST. Catharines, Ont.	
5. Upper Lakes Shipping Ltd., Toronto, Ont.	
6. Westdale Shipping Limited, Port Credit, Ont.	

<u>Shippers</u>	<u>Head Office</u>
1. Canadian Vegetable Oil Processing, Hamilton, Ont.	
2. Dominion Foundries and Steel, Ltd., Hamilton, Ont.	
3. Domtar Chemicals Limited, Sifto Salt Division, Montreal, P.Q.	
4. Dow Chemical of Canada Ltd., Sarnia, Ont.	
5. Maple Leaf Mills, Ltd., Toronto, Ont.	
6. Ontario Hydro, Toronto, Ont.	
7. Ontario Paper Company, St. Catharines, Ont.	
8. Petrosar Limited, Corunna, Ont.	
9. Polysar Limited, Sarnia, Ont.	
10. The Canadian Wheat Board, Winnipeg, Man.	
11. The Steel Company of Canada, Limited, Toronto, Ont.	
12. Union Carbide Canada, Limited, Toronto, Ont.	
13. United Cooperatives of Ontario, Mississauga, Ont.	
14. Victory Soya Mills, Toronto, Ont.	
15. Westeel-Rosco Limited, Toronto, Ont.	

As a consequence of the freedom in the manner of responding, comments came back in a variety of formats which made aggregation impossible. Users were promised complete confidentiality. Rather than providing data which could identify a company, only the conclusions and recommendations are provided in this section. In addition, cautions are raised wherever consequences of the toll increase are not clear.

#### Use of the St. Lawrence Seaway and Welland Canal

The following four tables indicate the use of the St. Lawrence Seaway and Welland Canal by region of origin and/or destination of the merchandise. While the first three tables consider only that traffic which passes through either of the two sections of the Seaway, the last one shows the amount of traffic which either originated and/or was destined to the U.S., that travelled on the several sections of the Great Lakes. The total tonnages shown on this table are smaller than the total reported in the previous three tables since non-U.S. movements are not reported.

It is clear that benefits accruing from the use of the Seaway cannot be easily allocated to specific regions. Tables 1, 2, 3 and 4 attempt to show that, of the total usage of the Seaway, Ontario serves as either beginning point, end point or both for 41% of all traffic going through the Montreal-Lake Ontario Section and for 52% of all traffic on the Welland. This does not mean that 41% and 52% of the use of the Seaway system should be attributed to Ontario. For instance, if all movements which begin and end in the U.S. were considered (39 million tons Welland Canal and

TRAFFIC DESCRIPTION BY COUNTRY OF ORIGIN  
BOTH SECTIONS OF THE SEAWAY

Lake Ontario-Montreal Section

Type of Traffic	1972 %	1973 %	1974 %	1975 %	1976 %
Canada/Canada	33.50	30.36	33.39	34.68	29.59
U.S.A./Canada	6.34	11.68	10.82	10.96	8.62
Canada/U.S.A.	21.82	26.67	29.20	27.83	34.63
U.S.A./U.S.A.	0.20	0.23	0.25	0.21	0.21
Canada/Import Export	8.43	5.20	5.70	5.50	5.64
U.S.A./Import Export	29.71	25.78	20.63	20.81	21.30
Total Tons Handled	53.60	57.60	41.10	48.00	54.40

Welland Canal Section

	1972 %	1973 %	1974 %	1975 %	1976 %
Canada/Canada	27.00	23.60	26.30	28.30	24.60
U.S.A./Canada	24.10	26.10	25.40	28.30	23.50
Canada/U.S.A.	20.00	25.00	27.50	24.20	31.00
U.S.A./U.S.A.	1.00	1.00	1.00	1.00	.60
Canada/Import Export	3.10	2.20	2.70	2.20	2.40
U.S.A./Import Export	24.80	22.00	17.30	16.60	18.00
Total Tons Handled	64.10	67.20	52.40	59.80	64.30

Source: St. Lawrence Seaway Authority Traffic Reports.

TRAFFIC DESCRIPTION BY REGION OF ORIGIN

WELLAND CANAL SECTION

<u>ORIGIN</u>	<u>DESTINATION</u>	<u>TONS</u>	<u>PERCENTAGE</u>
Ontario to Ontario		4,001,275	7.15
Ontario to Canada		11,408,663	20.39
Canada to Ontario		1,104,172	1.97
Ontario to Foreign		1,063,584	1.90
Foreign to Ontario		3,626	.01
U.S.A. to Ontario		11,025,118	19.71
Ontario to U.S.A.		475,238	.85
Sub Total		<u>29,081,676</u>	<u>51.98</u>
Canada to U.S.A.		12,464,196	22.28
U.S.A. to Canada		4,115,293	7.36
U.S.A. to Foreign		9,928,328	17.75
Foreign to U.S.A.		355,324	.63
U.S.A. to U.S.A.		<u>26,863,141</u>	<u>48.02</u>
Sub Total		<u>55,944,817*</u>	<u>100.00</u>

Source: Statistics Canada Catalogues 54-206, 54-207.

\*This figure which amounts to 93.5% of the total tonnage moving through the Welland Canal Section, is as complete a breakdown as can be derived from published Statistics Canada sources.



TRAFFIC DESCRIPTION BY REGION OF ORIGIN

LAKE ONTARIO - MONTREAL SECTION

ORIGIN	DESTINATION	TONS	PERCENTAGE
Canada to Ontario		4,508,065	9.69
Ontario to Canada		11,799,303	25.36
Ontario to Foreign		1,477,091	3.17
Foreign to Ontario		1,365,098	2.93
U.S.A. to Ontario		94,041	.20
Ontario to U.S.A.		31,552	.07
Sub Total		<u>19,275,150</u>	<u>41.42</u>
Canada to U.S.A.		12,992,059	27.92
U.S.A. to Canada		4,115,293	8.85
U.S.A. to Foreign		9,929,091	21.34
Foreign to U.S.A.			
U.S.A. to U.S.A		219,741	.47
Sub Total		<u>27,256,184</u>	<u>58.58</u>
Total		<u>46,531,334*</u>	<u>100.00</u>

Source: Statistics Canada Catalogues 54-206, 54-207.

\*This figure which amounts to 97% of the total tonnage moving through the St. Lawrence is as complete a breakdown as can be derived from published Statistics Canada sources.

FREIGHT TONS OF UNITED STATES TRAFFIC CARRIED ON THE GREAT LAKES BY AREA, CALENDAR YEAR 1975

(SHORT TONS)

AREA TOTALS	FOREIGN			DOMESTIC			
	OVERSEAS		CANADIAN	COASTWISE		LAKEWISE	INTERNAL
	RECEIPTS AND SHIPMENTS	THROUGH		RECEIPTS AND SHIPMENTS	THROUGH		RECEIPTS AND SHIPMENTS
LAKE SUPERIOR	2,942,711	---	6,842,760	---	---	63,897,731	---
ST. MARYS RIVER	123	2,942,711	426,474	---	---	2,135,971	---
LAKE MICHIGAN INCLUDING THE PORT OF CHICAGO (CHICAGO HARBOR, NORTH BRANCH, SOUTH BRANCH, SANITARY SHIP CANAL, CALUMET-SAG CHANNEL, LAKE CALUMET AND CALUMET HARBOR AND RIVER)	73,688,778	---	---	---	---	---	5,576
LAKE HURON	78,153,396	---	---	---	---	---	---
ST. CLAIR RIVER, INCLUDING CHANNELS IN LAKE ST. CLAIR	110,222,063	---	7,158,304	---	---	73,446,533	---
DETROIT RIVER	125,160,234	60,886	4,376,411	37,071	---	27,140,820	22,954,870
LAKE ERIE, INCLUDING UPPER NIAGARA RIVER	91,588,858	1,202	16,560	---	---	3,593,982	25
WELLAND CANAL	100,292,133	1,711,801	2,610,321	55,600	---	21,740,942	7,721
LAKE ONTARIO, INCLUDING LOWER NIAGARA RIVER	120,688,544	2,304,583	32,266,034	---	---	66,549,479	75,959
ST. LAWRENCE RIVER, BETWEEN INTERNATIONAL BOUNDARY LINE AND LAKE ONTARIO	39,171,093	---	1,188,996	---	---	---	---
NET UNITED STATES TRAFFIC ON THE GREAT LAKES	39,274,671	768	12,632,422	---	---	97,686	10,886
EXCLUDES TRAFFIC WHICH DID NOT TRAVERSE THE GREAT LAKES	27,144,264	1,497	448,077	7,178	55,600	117,678	39,385
	193,847,805	9,930,588	46,829,187	*62,678	---	129,360,411	*1,849,999
							5,814,942

Source - Waterborne Commerce of the United States, 1975  
Part 3 Waterways and Harbors Great Lakes page XI

27 million tons Lake Ontario-Montreal Section), the U.S. use of the System would amount to 70% in the case of the Welland Canal and 59% for the Lake Ontario-Montreal Section. In addition, a large percentage of the movements originates or ends in other provinces or countries and a portion of these movements are not described completely by the water section of the movement. An example of this would be the grain that originates in the prairies and terminates somewhere in the heart of Europe.

It is clear that Ontario, the U.S., the Prairies, Quebec, Labrador and other regions and countries benefit from the use of this system. It would be an idle exercise to attempt to calculate the exact shares of benefit and thence derive a ratio of cost contribution that should be made by each of the regions to the supporting of the system. These calculations would be inaccurate and their quality suspect. Even if the computations were done, the location of the taxation centre of each firm would still be unknown and the national ownership of firms doing business on this system would remain to be determined.

It follows that it is almost impossible to calculate whether a given region would be better off by having users pay directly rather than by paying for the upkeep of the system through their tax contributions.

On the whole, the recovery scheme being proposed by the Federal Government is neither helped nor hindered by the regional benefits argument.

## Determination of Impacts on Ontario Arising From a Toll Increase on the St. Lawrence Seaway System

Theoretically, the impact of toll increases on the St. Lawrence Seaway System could be large and varied in nature. Impacts could be classified in the following categories:

- a) Traffic pattern changes or switches;
- b) Phasing out of some service; or
- c) Traffic and induced price changes.

These primary effects would of course have direct repercussions on port activity and on industrial (shipper) activity, via; switching of plant location or curtailing of production, changes in employment, altered patterns of demand on the shipbuilding industry, overburdening of other transportation modes, price increases, worsened export position, etc. In addition, these effects may be a direct result of the toll increase or an indirect response to changed conditions arising from the toll increases, such as increase of prices on the fronthaul because of lack of backhaul, a shipping company going out of business, etc.

This analysis concentrates on events which in some form or another would affect the province. No consideration has been given to that traffic which does not either originate or end up in the province.

### Overall

#### The type of effect of the toll increase

At present, most of the shipping fleets on the Great Lakes fix their rates independently of cargo tolls charged on the system. A shipping rate is



arrived at exclusive of tolls, the shipper being responsible for paying the extra tolls required for crossing either or both sections of the Seaway. As a result of this, unless shipowners absorb part of the cost increase arising from tolls, it is expected that 100% of the toll increase will be directly absorbed by the shippers who use the Welland Canal and/or the Montreal-Lake Ontario sector.

The effect of the increase therefore will not be that of a smooth increase in shipping rates but a very specific increase, only affecting commodities, shippers and ports to the degree that they depend on the Seaway.

#### Ports

The main port activity in Ontario is concentrated in a few locations and depends on the shipment patterns of relatively few commodities.

Some of the tonnages and movement patterns are illustrated by the port activity tables for selected ports.

These tonnages illustrate the main nature of the water transportation industry and help to identify the areas where impact can be expected to be stronger.

PORT ACTIVITY IN ONTARIO - 1975

Movements Ending and/or Originating in an Ontario Port

	Totals	Selected Commodities										Major Tonnages			
		Iron Ore & Concentrate	Bituminous Coal	Wheat	Other Grain	Fuel Oil & Gasoline	Limestone & Stone	Salt	Cement	Soya Beans	Sand and Gravel	Gypsum	Dolomite		
Coastwise															
Loaded	25,848,283	2,651,938	605,484	10,346,642	3,277,782	2,914,347	2,930,711		596,177			974,341			
Unloaded	17,662,623	5,135,185	763,895	2,103,018	553,471	3,796,904	2,901,402	474,313							
Total	43,510,906														
International															
Loaded	9,844,564	3,229,609		131,887	545,746	1,699,667		950,492	636,954				1,070,517		
Unloaded	27,206,824	4,138,247	16,683,713		129,752		3,427,499	423,215		424,358	474,014				
Total	37,051,388	15,155,279	18,053,092	12,581,547	4,506,751	8,410,918	9,259,612	1,848,020	1,233,122	424,358	474,014	974,341	1,070,517		
As % of Total Handled by Ont. Ports	91.7%	18.8%	22.4%	15.6%	5.6%	10.4%	11.5%	2.3%	1.5%	.5%	.6%	1.2%	1.3%		
Total Com-modities Handled by Int. Ports	80,562,294														

Source: Statistics Canada Port Activity Statistics Publications.

PORT ACTIVITY BY SELECTED PORTS AND BY SELECTED COMMODITIES

	Thunder Bay			Hamilton	
	Wheat	Iron Ore & Conc.	Bit. Coal	Other Grain	Iron Ore    Bit. Coal
Coastwise					
Loaded	9,465,387	2,584,953	605,484	2,942,786	
Unloaded	(8,627,488)*				4,994,484    462,331
International					
Loaded	124,223	1,735,906	136,798	545,476	
Unloaded			51,316		2,651,711    5,573,043
Total Selected Commodities Handled					
As % of Total Port Activity					13,681,569
Coastwise					96%
International					5,232,913
Total					<u>9,037,454</u> 14,270,458

\*To Bay or Lower St. Lawrence Ports

Source: Statistics Canada Port Activity Statistics Publications.

PORT ACTIVITY BY SELECTED PORTS AND BY SELECTED COMMODITY

	Sarnia*		Nanticoke		Sault Ste. Marie	
	Wheat	Bit. Coal	Fuel Oil & Gas	Bit. Coal	Iron Ore	Bit. Coal
Coastwise						
Loaded	174,624		2,362,062			
Unloaded	128,516		107,442	171,601	1,035,022	
International						
Loaded			1,232,209			
Unloaded		2,662,465		3,769,533	1,373,510	1,981,997
Total Selected Commodities Handled		6,667,318		3,941,134	4,390,529	
As % of Total Port Activity		73%		100%	74%	
Coastwise		89% (Plus limestone)		3,769,533	1,690,564	
International		5,757,515		171,601	4,240,151	
Total		3,332,910		3,941,134	5,930,715	
		9,090,425				

\* 1,438,161 tons of limestone from the U.S.

Source: Statistics Canada Port Activity Statistics Publications



PORT ACTIVITY BY SELECTED PORTS AND BY SELECTED COMMODITIES

	Port Colborne*			Lakeview
	Wheat	Iron Ore	Bit. Coal Other Grain,	
Coastwise				Bit. Coal
Loaded	146,486		74,861	
Unloaded	381,349			107,619
International				
Loaded				
Unloaded		98,460	14,078	1,795,896
Total Selected Commodities Handled		859,547		1,903,515
As % of Total Port Activity		39% 88% (Plus dolomite)		100%
Coastwise		1,334,170		107,619
International		853,760		1,795,896
Total		2,187,870		1,903,516

\* 1,070,517 tons of dolomite loaded to U.S. destinations

Source: Statistics Canada Port Activity Statistics Publications.

PORT ACTIVITY BY SELECTED PORTS AND BY SELECTED COMMODITIES

Toronto

	Wheat	Other Grain	Soya Beans	Salt	Bit. Coal	Cement	Raw Sugar	Fuel Oil & Gas
<u>Coastwise</u>								
Loaded	7,650							212,654
Unloaded	185,272	127,212		144,759		480,875		234,317
<u>International</u>								
Loaded								102,129
Unloaded			288,573	85,742	179,587		187,758	14,718
Total Selected Com. Handled					1,687,428			
As % of Total Port Activity					56%			
Coastwise					1,538,218			
International					<u>1,448,946</u>			
Total					2,987,164			

Source : Statistics Canada      Port Activity      Statistics Publications

The activity of ports in Ontario amounted to 80.5 million tons of goods handled. Activity is almost exclusively related to the handling of bulk commodities. As the attached port activity table shows, the ten major bulk commodities account for 92% of the total handled, while the commodities that have been isolated as main Seaway users, namely iron ore, wheat, bituminous coal and other grain account for 62.4 percent of the total tonnage handled by Ontario ports.

Thunder Bay: As the table shows, 91% of the activity of Thunder Bay hinges on the loading of four major bulk products: wheat, other grains, iron ore and concentrates and bituminous coal.

In the 1975 data, use of the Seaway is distributed by listed commodities as follows: \*

The international loadings of ore and coal do not use any portion of the Seaway, the international loadings of wheat and other grain use both sections for half of the other grain and for all of the wheat. For wheat, the affected international tonnages are direct loadings onto foreign vessels and are destined to overseas destinations.

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\* To understand the Statistics Canada data letter, data on commodities is broken down into "international" and "coastwise".  
See Appendix \_ \_ \_ for definition.

It is felt that with the fluctuations that are normal in this type of market, the imposition of tolls would not discourage continued business. However, growth rates may be affected.

The coastwise traffic is broken down in the following fashion: half of the iron ore and concentrates movements use the Welland (going to Hamilton). The half that ends up in Port Colborne and at the Soo does not use the Seaway at all. The half that does use the Seaway is destined for the steel plants. Neither of these expect to shift any of their incoming shipment patterns for iron ore.

Bituminous coal is split, with two-thirds going to Hamilton through the Welland and one-third going to Nanticoke. The Hamilton destinations are the steel plants. Even if some shift occurred from direct Hamilton shipments to transshipments at Nanticoke (which is considered unlikely), Thunder Bay would continue to be the origin point for this coal.

The grain then, represents the only sensitive traffic as far as future prospects at Thunder Bay are concerned. A breakdown of Seaway usage for grain from Thunder Bay follows.

Eighty-one percent of the wheat uses both sections of the Seaway while eighty-five percent crosses the Welland Canal. It should be remarked that ninety-nine percent of this is prairies grain, on its way through Thunder Bay to Georgian Bay Ports or directly to lower St. Lawrence ports and the export markets. As such, it is not the Georgian Bay area, but the prairies



who end up paying this increase in tolls. Thunder Bay would suffer an impact if the grain was rerouted, but this would not automatically occur with the imposition of tolls.

In addition to the comments in the other sections on the alternative transport routes, it is interesting to note that in 1975 no Canadian grain used the Mississippi route. A brief rate analysis of alternative grain movements is provided which reveals the advantages of the Great Lakes route even with a toll imposition. As well, informal talks with Wheat Board personnel led to the belief that no shift of any consequence will occur on this grain route as a consequence of the increase in tolls, especially since it appears that grain will receive special rates treatment.

#### Hamilton

In 1975, ninety-six percent of the port activity in Hamilton was made up of unloadings of iron ore and Bituminous Coal destined to either Stelco or Dofasco. The Iron Ore coming into Hamilton coastwise originated in the Quebec and Labrador Mines, coming up via the Lake Ontario-Montreal Section but making no use of the Welland.

International Ore movements all originate west of the Welland, as did all the coal. All these movements have to transit the Welland to arrive in Hamilton.

Both Stelco and Dofasco have indicated that they would not shift any of this traffic in the future, with Dofasco stating that some shift to unit trains would

be physically possible but not given the present cost relationships (the toll increase considered). Hence traffic at Hamilton will not be affected by the toll increase.

With respect to other ports, they either do not depend as much on the Seaway for their traffic, (e.g., Sault Ste. Marie or Nanticoke), or the traffic is very varied with a high proportion of higher valued goods (as Toronto) or depend on traffic patterns of specific goods (e.g., Sarnia), and will be treated implicitly below.

#### Specific Goods Grains

In addition to the analysis of prairies grain, the following issues from the questionnaires should be noted:

- Milling wheat received by mills downstream of the Welland might be shifted to Bay port mills;
- The transportation rates on rail will favour Bay ports relatively more since rail rates to Montreal are equalized from Southern Ontario and the toll only applies to Welland and Seaway movement;
- It has been learned that for feeds and grains, the railway rates are water competitive from Southern Ontario to Montreal. Though this situation might imply a shift to rail from some of these locations, users

have stated that the most probable course of events would be a parallel price increase by the railways on their rates;

- Elevators below the Welland may lose some business to Bay port elevators, Ontario processing might lose some marginal business to direct western processing.

As previously mentioned, the inland transportation of grain is but one aspect in a complex chain of economic events. Statutory rail grain rates to Churchill and the West Coast ports provide the farmers with the least-cost method of shipping their grain, but demand from buyers as to where they take possession of their Canadian grain is split between East and West Coast ports. On the eastern side of the continent, the ocean rates at the St. Lawrence, Atlantic and N.S. Gulf port fluctuate substantially, so that relative freight advantages of the ports change frequently. These changes have not diverted any of the Canadian grain movements, and this brings into question the cost sensitivity of the movement as it relates to a toll increase.

Diversion from water to rail unit train has been recently advocated, but this is not a viable economic alternative. Leaving the logistic problems aside, and just considering the rate aspect, one can see from the following table, prepared by Snavelly for the Ministry of Transport, that water rates are still far below those of rail. A comparison to the St. Lawrence River ports would produce an even greater spread in favour of the water rates because of the greater backhaul situation.

Comparative Analysis of Mode Competitive Rates  
and Charges on Grain from Thunder Bay to  
Halifax, N.S. and Saint John, N.B.

<u>Item</u> (1)	Rates Per Ton Via			
	<u>All Water Route</u> (2)	<u>Water/Rail Route *</u> (3)	<u>Route **</u> (4)	<u>All Rail Route</u> (5)
1. Lakehead Fobbing & Harbor Dues	\$2.08	\$2.08	\$2.08	\$1.25
2. Lake Freight	10.17	2.82	2.83	--
3. Fuel Surcharge	.17	.13	.13	--
4. Elevation at Bay Ports				
a) Inbound	--	1.17	1.17	--
b) Outbound	--	.83	.83	--
5. Insurance	.78	.26	.26	--
6. Lake Freight Brokerage	.08	.04	.04	--
7. Lockage, Tolls, Warfage	.84	--	--	
8. Rail Rate	--	5.05	16.80	19.78
9. Rail Shrinkage	--	.18	.18	.18
10. Sub-total	14.12	12.57	24.32	21.21
11. Government Subsidy	--	10.35	--	--
12. TOTAL	\$14.12	\$22.92	\$24.32	\$21.21

\*Current At-and-East rate basis.

\*\* Assumed repeal of At-and-East rates.

From report prepared by Snavelly, King and Associates Incorporated,  
October, 1976, for the Ministry of Transport.



### Soya Beans

Canada is not self-sufficient in bean production and about half of what is processed is imported from the United States. Under the present system of marketing soya beans in Canada, Ontario grown soya beans are subject to the terms of a marketing agreement which comes under the Farm Products Marketing Board. The agreement states that "the minimum price for soya beans shall be the cost of imported soya beans". It is not clear whether the toll increase will have the effect of increasing the price of Ontario grown soya beans as well as that of the beans which come through the canal because of this agreement.

Two major complaints have been made by processors. Canadian producers compete in the Canadian market with U.S. firms which ship their finished product into Canada, duty free. The U.S. firms do not use the Seaway and are thus not faced with the increase. The second complaint is that "Canadian" meal produced from U.S. beans is subject to a duty of \$6.00 per ton if sold in the U.S. One producer felt that with the toll increase, his company would be excluded from the U.S. market. The problem here appears to be one of trade agreements rather than transportation. U.S. goods enter Canada duty free while Canadian export goods are faced with stiff tariffs.

This industry would certainly benefit from a phasing in of the toll increase.

### Fuel Oil

Contact with three of the major shippers of gasoline and fuels resulted in the following overall conclusions.

No shift of significance will result as a consequence of the toll increase.

There exists some tonnage susceptible to unit train movement. There could be a switch in this area but the deciding factors are the possibility of year-round movement and consequently diminished winter storage costs, not the toll increase.

### Salt

One company has been contacted who predicts a switch of circa 300,000 tons/year from vessel to rail and trucks. No other direct effects are predicted with the exception of plans for attempting to recoup higher transportation costs from shippers and consumers.

This example is, however, symptomatic of what the situation would be with most of the high bulk, low value commodities such as rock, cement, stone, sand and gravel. Though companies in this business have not been interviewed, many cautions have been received as to possible switches. It is expected that this switching will involve mainly origin-destination patterns rather than a transfer of loads from one mode to another. However, a complete picture could only be given after more detailed study.

It is felt that whatever shifts occur would have better time to work themselves out, if the increase of tolls was phased in rather than imposed in one step.

### Iron Ore & Coal

These two commodities have been covered mostly in other sections, but a brief capsule is offered here. Ontario tonnages of iron ore that use the Seaway end up in the Hamilton steel plants. This industry indicated a marked preference for water movement. The other large user of coal is Ontario Hydro. Large amounts of coal for Ontario Hydro come in to Nanticoke from U.S. ports above the Welland, or from Thunder Bay. These tonnages will not be affected by the toll increase. The tonnage that is likely to be affected is that of U.S. coal moving through the Welland to Lake Ontario ports. One probable effect of the toll increase, according to Hydro, is that production at the Lake Erie and Lake St. Clair facilities might be stepped up, substituting part of the activity of their Toronto generator, thus avoiding the need for some of the tonnage that goes down the Welland. No other effects are expected but for vague hints as to long term location of plant. Thus, on the whole, no impact on traffic is expected on these movements.

The total affected tonnages taking the three concerns into consideration amounts to 11,189,000 tons through the Welland Canal and 3,254,000 tons through the lake Ontario-Montreal section. The following rate estimations are provided as an illustration of some of the price differences involved if modal switches are attempted.

Coal

Ex. Chinchfield, Va.	<u>To</u> Sandusky, Ohio
Rail: 7.29/N.T.	(Tariff Ref. N&W c.c A 157 E Item 825)
Sandusky, Ohio	- Hamilton, Ontario
Water: 1.25/N.T.	(Estimated)

Ex. Clinchfield, Va.  
To Hamilton Toronto  
Via Rail 12.05/N.T. (Esitimated) 12.41/N.T. (Estimated)

Chisholm, Ky.	-	Sandusky, Ohio
Rail: 7.29/N.T.	(Tariff Ref. N&W C.C.A 157 E)	
Sandusky, Ohio	-	Hamilton
Water: 1.25/N.T.	(Estimated)	
Ex. Chisholm, Ky.		
To Hamilton		Toronto
Via Rail 13.05/N.T.	(Estimated)	13.48/N.T. (Estimated)

Duquesne, Pa.	Conneaut, Ohio
Rail: 6.00/N.T. (Tariff Ref. N&W No. 112B, Item 400)	
Conneaut, Ohio	Hamilton
Water: 1.15/N.T. (Estimated)	
Ex. Duquesne, Pa.	

<u>Hamilton</u>	<u>Toronto</u>
Rail 14.31/N.T.*	15.29/N.T.*

\*Estimated Rates: Rail rates are an extrapolation of the existing published rates from origins to lake ports.  
Water rates are based on historical rates which have been adjusted to account for inflation.



Iron Ore

Eveleth, Minn. - Duluth/Superior, Minn.

Rail: 3.09/Gross Ton (Duluth, Missauba, Iron Range,  
Rly. Tariff No. 2015)

Plus Terminal Charge: 44¢/G.T.

Duluth/Superior - Hamilton, Ont.

Water: 4.05/Gross Ton (Tariff Ref. Skilling Mining  
Review)

Eveleth, Minn - Hamilton

Rail: 38.11/G.T. (Estimated)

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Bruce Mines: Thunder Bay

Rail: 5.61/Gross Ton (C.N. 1036J, Item 80)

Plus Terminal Chrg. 75¢

Thunder Bay - Hamilton

Water: 1.78 1/8/G.T.

Bruce Mines - Hamilton

Rail: 20.68/Gross Ton (Estimated)

### Objections Raised by Industry

Those complaints regarding imposition of tolls which industry has raised and are either industry specific or related to some movement pattern, have been commented on in other parts of this section or of the study. A brief list of other complaints and suggestions is made here accompanied with some comments where applicable.

### Price Increase

Some industries have argued that the toll increase would be inflationary in nature, as it would precipitate price increase to recoup from their own clients the extra costs paid in tolls.

1. If the costs of maintenance and operation are escalating, their provision from public funds, assuming the use of public funds to be relatively committed and inelastic, is inflationary as well.
2. The degree to which this is inflationary depends on the restraint of the shippers and carriers in their drive for increases.
3. The increased burden placed on Seaway users not to make frivolous use of the facilities - which may be occurring in some few cases - could partly counteract the inflationary trends.

### Worsened Competitive Export Position

This argument is normally used by the same people who complain about subsidized foreign producers having access to local markets, which is

the present position of Seaway users. This argument depends heavily on the relative situation of the party wielding it.

#### Loss of Business

Questionnaire replies as well as other analysis revealed few expectations of loss of business as a consequence of toll increases:

1. A soya meals producer would see his position threatened because of trade regulations and tough competition, he cannot pass the cost increase along.
2. The situation is hard to assess in the high bulk, low value market: sand, stone, gravel, salt, etc., although it seems that most of the effect will entail rerouting.
3. There will be greater caution with future expansion plans in the ship-building industry.
4. One carrier has stated that he might stop the package freight side of his business, a move which has been used as a threat for a number of years. Package freight seems to be on the decline independently of the new tolls situation.

### Overburdening of Railway Capacity

The greater speed, lack of seasonality and increased versatility of railways coupled with this 'last straw' would induce many businesses to switch to rail and overburden the capacity of this mode.

While there is no evidence to support this view, not much light can be thrown on this issue due to the relative freedom which exists in pricing services at the railway level. In effect though, it is expected that the railways will follow suit and increase rates proportionally.

### Traffic Patterns

On specific goods, this issue has been commented upon at length. Most of the study conclusions have been derived from the interviews with and replies given by the users. The little rate analysis that has been carried out supports these conclusions as do other studies and expert opinion.

However, there is no such thing as perfect data, adequate foreknowledge, or an infallible model to predict traffic patterns given the imposition of tolls.

In general, it is concluded that traffic patterns for movements of provincial interests will stay much the same as they are at present. This assumes, of course, that "non-provincial" movements remain in the present balance. For some goods or special traffic corridors, the transportation market is very competitive and drastic changes could occur overnight.



General

Industry has had two consistent comments:

- Great Lakes Business should be marketed and advertised;
- The St. Lawrence Seaway Authority should be accountable to the users in some fashion or other;
- Other modes of transportation should not be allowed to underprice the water mode unless their costs on a fully allocated basis warrant lower rates.



## APPENDIX





## APPENDIX

### New Seaway Tolls

Throughout the process of negotiating with the U.S., the Canadian Government has changed some of the details of the toll increase proposal. At the time of printing, the enclosed plan was the last official toll increase plan announced by the Federal Government.

### Definitions

Throughout this report, several sources of data were used. The following pages are reproductions of the definition pages in publications used most frequently. Definitions of terms should be consulted here.

Tons of 2000 lbs. are used throughout this report. Definitions apply according to the main source quoted on the bottom of each table.

### Questionnaires

A blank copy of the shipper and carrier questionnaires is included. As mentioned in the text, answers to the questionnaires varied so much in format that aggregation proved impossible.

### Subsidies

A section discussing some of the concepts and facts related to the subsidization of the Seaway concludes this appendix.

NEW SEAWAY TOLLS\*

"OTTAWA -- Tentative agreement on St. Lawrence Seaway tolls has been reached by officials of the United States and Canada, Transport Minister Otto Lang said today. It is the first toll increase since 1959.

The toll schedule being proposed is the result of months of discussions between the two nations and was agreed to earlier this week by the Department of Transportation's Saint Lawrence Seaway Development Corporation and the St. Lawrence Seaway Authority of Canada.

The new tariff, which will not become final until after a public hearing in the U.S., would take effect with the opening of the 1978 Seaway navigation Season.

Mr. Lang observed: "The new tariff appears to address realistically the concerns of both nations. The negotiators on both sides have gone to great lengths to minimize the impact on key commodities, while at the same time permitting the U.S. and Canada to recover their costs for the Seaway in a manner consistent with the policies of both nations."

Paul D. Normandeau, Seaway Authority President, added: "The proposed toll charges are significantly different in several respects from those originally suggested by Canada. The tolls we are now proposing reflect special considerations for certain commodities such as grains, containers, and government aid cargoes."

Toll increases are necessary to meet increased costs in both countries.

As a result of inflation since 1959, operating expenses have increased to the point where revenues are no longer adequate to meet the costs of the Seaway entities. The new tariff is expected to recover in 1978 for Canada approximately \$51.0 million in revenues from the Welland and its share of the International section revenues.

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\*Text of Information Pamphlet released by Transport Canada in  
Ottawa on August 4, 1977

The U.S. in turn expects to recover \$10.8 million as its share of revenues on the International section.

For the first time since the Seaway opened to deep draft navigation in 1959, there would be a toll increase in the Montreal-Lake Ontario (International) section. On the Canadian Welland Canal section - the connecting channel between Lakes Ontario and Erie - International and Welland sections of the Seaway would be assessed on the basis of an expanded listing of commodity classes. Also new would be the assessment of tolls on the basis of metric tons (1,000 kilograms or 2,204.62 pounds) rather than short tons (2,000 pounds).

Under the proposed tariff, new classes for grain, government aid cargoes and containers have been identified. The new classes would be charged tolls on the International section that are lower than those presently assessed for either bulk or general cargo. Increases are recommended on all other cargoes in the existing bulk and general classes.

On the Welland, the existing \$100 fee per lock would be replaced by commodity tolls. For each of the two Seaway sections there also would be a charge of 7¢ per gross registered ton of a commercial vessel, compared to the 4¢ per gross registered ton presently charged such vessels transiting the International section.

Once the public hearings have been held in the U.S., comments on and objections to the proposal received in both countries from interested parties will be evaluated and a decision reached either to approve the recommended new tariff of tolls or to further revise it. When a tariff has been approved, diplomatic notes will be exchanged between the governments of the U.S. and Canada officially placing into effect the new tariff.

New toll charges per 2,000-lb. ton for the International section would be as follows: 37¢ for grains ( a new class, formerly under bulk cargo); 62¢ for containers (a new class, formerly under general cargo); and 37¢ for government aid cargo ( a new class, formerly under general cargo); 62¢ for bulk cargo; \$1.50 for general cargo. Cargo transiting the Welland would be charged 45¢ per short ton on general cargo and a toll of 28¢ per short ton on all other commodities.

The commodity tolls on the Welland would be the first since 1962, when a nominal toll schedule was suspended. Since 1967, a lockage fee for the use of the eight Welland locks has gradually been phased in and that fee for commercial vessels since 1971 has been \$100 per lock.

The Seaway entities also noted that the new tariff would entail increases for passengers aboard ships, and for small craft transits. The accompanying sheet compares the various tariff items with the existing charges and the original Canadian proposal and it also translates the new proposal per short ton into its metric ton equivalent.



Comparison of Tariff Items

<u>Comparison of Tariff Items</u>	<u>Per Short Ton</u>			<u>Assessed Per</u>
	<u>Existing</u>	<u>Canadian</u>	<u>New</u>	<u>Metric Ton</u>
		<u>Proposal<sup>1/</sup></u>	<u>Proposal</u>	<u>New Proposal</u>
<u>Montreal-Lake Ontario</u>				
<u>Section (International)</u>				
Bulk.....	\$ 0.40	.45	.62	.68
General.....	0.90	1.05	1.50	1.65
Grain.....	0.40	N/A	.37	.41
Containers .....	0.90	N/A	.62	.68
Government Aid Cargoes..	0.90	N/A	.37	.41
Vessel Charge, per gross registered ton.....	0.04	.04	.07	.07

Welland Canal Section

Vessel, Charge for 8 locks..... <sup>4/</sup>	\$800.00	-	-	-
Bulk.....	N/A	.40	.28	.31
General.....	N/A	.90	.45	.50
Grain.....	N/A	N/A	.28	.31
Containers.....	N/A	N/A	.28	.31
Government Air Cargoes.. <sup>3/</sup>	N/A	N/A	.28	.31
Vessel Charge, per gross registered ton.....	N/A	.04	.07	.07

Combined Sections

Vessel, Charge for 8 locks..... <sup>4/</sup>	\$800.00	-	-	-
Bulk.....	.40	.85	.90	.99
General.....	.90	1.95	1.95	2.15
Grain.....	.40	N/A	.65	.72
Containers.....	.90	N/A	.90	.99
Government Aid Cargoes.. <sup>3/</sup>	.90	N/A	.65	.72
Vessel Charge, per gross registered ton.....	.04	.08	.14	.14

- <sup>1/</sup> Original Canadian proposal of December 1976.
- <sup>2/</sup> The proposed tolls will actually be assessed on a metric ton (1,000 kilogram) basis as shown in this column.
- <sup>3/</sup> Government aid cargo includes cargoes currently classed in the general category.
- <sup>4/</sup> The lockage fees for the Welland Canal are \$100 per lock for a loaded vessel and \$50 per lock for a vessel in ballast.

ST. LAWRENCE SEAWAY

TRAFFIC REPORT

1976 Navigation Season

Definitions

The following definitions should be noted in the interpretation of the tabulations contained in this Annual Traffic Report of the St. Lawrence Seaway for 1976:

- a) Transit - means a partial or complete upbound or downbound passage of a vessel through one or more locks of a Seaway canal.
- b) Gross Tons - means the gross registered tonnage of a vessel according to the country of registry.
- c) Cargo Tons - means the tons of 2,000 pounds of cargo carried by a vessel on each or any transit.
- d) Bulk Cargo - is the tons of cargo of 2,000 pounds assessed at the bulk rate for Seaway tolls.
- e) General Cargo - is the tons of cargo of 2,000 pounds assessed at the general rate for Seaway tolls.
- f) Mixed Cargo - is indicated where a vessel carried both bulk and general cargo on a single transit.
- g) Commodity - the classification of commodities is based on that prescribed by the Canadian Transport Commission and the Interstate Commerce Commission of the United States.
- h) Tug and Barge Combinations - the assessment of tolls requires tugs and barges in common transit to be considered as one unit. In this report, the number of transits shown under this category represents the number of combined passages plus the number of individual tugs transiting the Seaway.

- i) Package Freight - designates cargo consisting of miscellaneous packages generally unidentifiable as to commodity and carried only on vessels licensed by the respective Authorities in Canada and the United States. "Domestic Package Freight" indicates shipments originating and terminating in Canada or the United States. "Foreign Package Freight" consists of cargoes originating overseas and transhipped at a Canadian port for delivery in Canada or the United States.

It should be noted, in any analysis, that there is not necessarily a relationship between a specific commodity and a "bulk" or "general" cargo toll assessment. Bulk assessments include provision for "general" commodities moved in domestic traffic while small shipments of other commodities ordinarily in the "bulk" category may, according to the method of packaging, handling or special refinements, be assessed as "general" cargo.

This report is presented in bilingual format, i.e., English and French, and in order to facilitate comparison it is patterned closely on the 1975 publication with the exception of "net tons" which has been deleted from all tables. All pages and tables are numbered to correspond exactly to the 1975 report. Since this summary is intended to show an analysis of cargo traffic, Pleasure Craft transits are omitted from all tables except Table 8, page 9, where Pleasure Craft lockages are shown. Toll revenues and lockage fees reported for the Montreal-Lake Ontario and Welland Canal Sections do not include Pleasure Craft receipts and/or penalty charges, and therefore, will not agree with the Annual Financial Statement.

Order-in-Council P.C. 1962-1032 directed that effective July 18, 1962, tolls for the transit of the Welland Canal would be suspended. This was superseded by a system of lockage charges, effective April 1, 1967, under Order-in-Council P.C. 1967-587. The tables for the Welland Canal Section were amended slightly in 1967 to record the lockage charges and the format reverted to the pattern of 1961.

Footnotes appended to several tables will facilitate the interpretation of the figures shown.

# Shipping report

## Treatment of Data

Only data relating to those vessels which are engaged in port-to-port transportation of goods and/or passengers for compensation have been included; all intra-port movements have been excluded.

The term "international seaborne shipping" is used for vessels classed as being in foreign service, that is when (1) the vessel arrives from or departs for a foreign port; or (2) cargo is loaded for or unloaded from a foreign port; or (3) the registry of the vessel is other than Canadian or British Commonwealth (even though the vessel may have sailed between two Canadian ports).

A vessel is classed as being in coasting service if (1) it is of Canadian or British Commonwealth registry, sails between two Canadian ports and loads or unloads no foreign freight; or if (2) it is of foreign registry, but is granted a waiver to engage in coasting service.

The terms "origin" and "destination" as used in this publication refer only to the ports of loading and unloading and not necessarily to the ultimate (perhaps inland) terminal points in some commodities movement. When using Tables 23 and 24, the cargo tons loaded refer to the volume shipped from the selected port to the destination specified in the second column; with an unloading figure, the roles are reversed, the selected port becoming the destination.

Countries are divided by geographic areas, first Commonwealth nations, then other countries. The order is as follows: Western Europe, Eastern Europe, Middle East, Other Africa, Other Asia, Oceania, South America, Central America, North America. Full country nomenclature and system of classifying comprises Appendix A. Appendix B consists of a commodity list, based on the *Standard Commodity Classification Manual* published by Statistics Canada, into which all cargo types are grouped; reference to this appendix will enable users to obtain a complete description of those commodities which have been necessarily abbreviated in the tables. Sequence of commodities is from Live Animals through End Products as described in this appendix.

The term "general cargo" in this publication refers only to commodities which were not specifically identified in shipping reports, it is not intended to indicate any distinction between bulk and other commodities.

Transshipments of cargoes, which are cargoes coming into a Canadian port en route to a port in a foreign country by water, are reflected in port totals. For example, cargoes unloaded from one vessel at Vancouver and re-loaded onto another vessel are recorded as a loading and unloading at that port.

For international trade, the published loadings and unloadings do not represent the exports and imports at a particular port because they include transhipped cargoes. (This term should not be confused with "goods-in-transit", goods neither loaded nor unloaded and therefore not recorded as a shipment.)

The letters "n.e.s." found in the commodity listing mean "not elsewhere specified".

Cargoes which are loaded in one navigational season but not discharged till the following season are recorded in the following year's annual report.

All volume data are presented in tons of 2,000 pounds.



# WATERBORNE COMMERCE OF THE UNITED STATES

CALENDAR YEAR 1975

## PART 3 WATERWAYS AND HARBORS GREAT LAKES

### TERMS FOR KIND OF TRAFFIC

The terms applied to the kinds of traffic as found in these publications are explained as follows:

#### Pertaining to Ports

Imports and exports.—These terms apply to traffic between the United States and foreign ports, including the Canal Zone. Traffic of U. S. Great Lakes ports with Canada is supplemented by the term "Canadian" to differentiate it from overseas traffic.

Coastwise receipts and shipments.—These terms apply to domestic traffic receiving a carriage over the ocean, or the Gulf of Mexico, e.g., New Orleans to Baltimore, New York to Puerto Rico, San Francisco to Hawaii, or Puerto Rico to Hawaii. Traffic between Great Lakes ports and seacoast ports, when having a carriage over the ocean, is also termed "coastwise." The Chesapeake Bay and Puget Sound are internal bodies of water; therefore, traffic confined to these areas is "internal" rather than "coastwise."

Lakewise receipts and shipments.—These terms apply to traffic between United States ports on the Great Lakes System. The Great Lakes System is treated as a separate system rather than as a part of the inland system.

Internal receipts and shipments.—These terms apply to traffic between ports or landings

wherein the entire movement takes place on inland waterways. Also termed internal are movements involving carriage on both inland waterways and waters of the Great Lakes; inland movements that cross short stretches of open waters which link inland systems; marine products, sand and gravel taken directly from beds of the oceans, the Gulf of Mexico and important arms thereof; and movements between offshore installations and inland waterways.

Local.—Movements of freight within the confines of a port whether the port has only one or several arms or channels, except car-ferry and general ferry, are termed "local." The term is also applied to marine products, sand, and gravel taken directly from the Great Lakes.

Intraterritory receipts and shipments.—These terms apply to traffic between ports in Puerto Rico and the Virgin Islands, U. S. A., which are considered as a single unit.

#### Pertaining to Rivers, Federal and Private Canals, Connecting Channels, and Intracoastal Waterways

The terms "imports," "exports," "coastwise receipts," "coastwise shipments," "internal receipts," and "internal shipments" are used as at ports.

Upbound and downbound.—These terms are applied to movements within the confines of a river, intracoastal waterway, canal, or a segment of one of these channels as described in the "Section included" for each channel.

Inbound and outbound.—Traffic moving from one waterway into another is termed "outbound" in the case of the shipping waterway and "inbound" with respect to the receiving waterway.

Through traffic.—Traffic moving through a waterway to and from points on other waterways is termed "through traffic."

#### General Terms

Freight reported under the terms "car ferry" or "general ferry" is not directly included in the port or channel tonnage, but is separately stated and tabulated.



# Saint Lawrence Seaway Development Corporation

## NOTES TO FINANCIAL STATEMENTS

1. Plant, property, and equipment are stated at cost of acquisition or construction. Indirect costs incurred prior to the opening of the Seaway on April 25, 1959, have been allocated to the related permanent features of the Seaway.

2. The straight-line method of depreciation is used and is computed on balances in plant in service. Accumulated reserves are accounted for on a composite basis by groups of assets. The cost of plant retired, including the cost of removal, less salvage is charged against the reserves. Neither depreciation nor amortization allowances have been provided for lands in fee.

3. To preserve the Corporation's borrowing authority to meet future emergency cash requirements, revenues have been retained to provide working capital during the winter non-navigation season. These revenues are deposited in the Corporation's account with the United States Treasury.

4. To support the President's Minority Bank Deposit Program, the Corporation maintains deposits in a number of minority banks throughout the United States to help expand opportunities for minority

business enterprises. All deposits are insured by the Federal Deposit Insurance Corporation.

5. The Congress authorized the Corps of Engineers to determine the means of extending the navigation season of the Great Lakes and the Seaway and to demonstrate the practicability of extending the season (Public Law 91-611). The portion of the funds appropriated to the Corps are allocated to the Corporation as one of the participating agencies in the Demonstration Program. As of December, 1974 \$388,096 of appropriated funds received under this program remain unexpended and are included in accrued liabilities and reflected in cash at December 31, 1974.

6. The deficit of \$12,654,335 is the net accumulation since the opening of the Seaway in 1959 and reflects the excess of expenses over revenues, including some \$22,570,738 in accumulated depreciation.

7. As of December 31, 1974, there are no outstanding claims pending against the Corporation. In addition to the current liabilities at December 31, 1974, there are undelivered orders and contracts amounting to \$418,082 which includes \$129,354 for the Demonstration Program.

## Notes to the financial statements

for the 15 months ended March 31, 1976

### 1. Significant Accounting Policies

**CHANGE IN FINANCIAL YEAR** — By Order-in-Council P.C. 1975-799 dated April 8, 1975, the financial year of the Authority was changed from the calendar year to a year ending March 31st. Consequently, the current financial statements cover the 15-month period from January 1, 1975 to March 31, 1976.

**COMPARATIVE FIGURES** — Comparative figures have been restated to conform to the 1976 presentation. It should be noted that the current period includes 15 months while comparative figures presented are for 12 months.

**PARLIAMENTARY APPROPRIATIONS** — The deficits of the Welland Section and Non-Toll Canals are recovered from parliamentary appropriations. The recoveries are reported in the Statement of Income, Expense and Deficit. Parliamentary appropriations used to finance capital assets are added to Contributed Capital.

**CONTRIBUTED CAPITAL** — Contributed capital represents the transfer value attributed to capital assets received from Canada and the amount of parliamentary appropriations used to purchase capital assets. Contributed capital is reduced by the cost of such assets taken out of service.

**CAPITAL ASSETS** — Capital assets are recorded at cost, except for those entrusted to the Authority in 1959 as part of the deep waterway system, which are recorded at values established by Canada.

**Non-Toll Canal assets** with a value of \$8,571,755 are under the administration of the Authority, but do not form part of the deep waterway system. Since the Authority does not hold title, the assets are not recorded in its accounts.

**DEPRECIATION OF CAPITAL ASSETS** — Depreciation is provided on equipment and machinery having an estimated life of less than fifty years in the Montreal-Lake Ontario Section. No provision for depreciation is made for other assets — including non-movable structures such as buildings, lock gates, locks and bridges.

### 2. Investments in Subsidiary Companies

An investment of \$8,000 represents the total capital stock of The Seaway International Bridge Corporation Ltd. which has annually paid over its earnings to the Authority.

An investment of \$1,500 represents the total capital stock issued by the Great Lakes Pilotage Authority, Ltd. Deficits incurred since acquisition have been recovered from parliamentary appropriations voted for that purpose.

Consolidated statements of The St. Lawrence Seaway Authority and its subsidiaries have not been prepared, as each entity has distinctly separate operations and, as Crown Corporations, each reports directly to Parliament through the Minister of Transport.

### 3. Loans from Canada

Loans to finance the Montreal-Lake Ontario Section of the Seaway, together with interest, are to be repaid in such amounts each year as the cumulative net profit of the Section will permit. Any unpaid interest in respect of any year bears interest until paid, and the principal and interest are to be fully paid on or before December 31, 2009. At March 31, 1976 outstanding loans and deferred interest on the Montreal-Lake Ontario Section of the Seaway amounted to \$336,500,000 and \$159,383,728 respectively.

Loans to finance the cost of modernizing the Welland Canal effected prior to September 23, 1966 are interest-free. All loans effected after that date bear interest. Accrued and unpaid interest amounted to \$32,822,016 during construction and was capitalized up to March 31, 1973, when the Canal became operational. Repayment of loans and accrued interest is not required until the Minister of Transport determines that the project is complete and approves the repayment terms. At March 31, 1976 outstanding loans and deferred interest on the Welland Section of the Seaway amounted to \$288,450,000 and \$32,822,016 respectively.

Interest rates on the indebtedness range from 3¼% to 10 3/8%.

### 4. Claims

In the normal course of business a number of claims and lawsuits have been brought against the Authority and the Authority has initiated certain claims and suits against others. The Authority does not expect that it will incur any material losses upon resolution of these actions.

### 5. Employee Termination Benefits

Termination benefits paid to employees are expensed in the year of termination or retirement. The financial statements do not reflect the termination benefits accruing to employees under labour contracts and conditions of employment. The amount of benefits earned to March 31, 1976, which will become payable on termination or retirement of employees, is estimated to be \$6,000,000.

Questionnaire

Impact of St. Lawrence Seaway System Toll Increase

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The aim of the attached questionnaire is to identify those areas and aspects of your operation which might be affected by an increase of tolls on the Seaway System and the Welland Canal.

This statement of purpose will hopefully enable you to correct us or to insert additional material wherever you think we have failed to ask a basic question.

The questionnaire will be used to establish the nature, volume and impact of your operation as well as to isolate that portion of it which in one way or another is dependent on the Seaway System and the Welland Canal. We would like to obtain as precise a definition and description as possible of the traffic dependent on the Welland Canal, including origins and destinations, commodity prices, rates and the possibility of using alternative routes or modes. This material should outline explicitly and in detail the characteristics of the transportation operation. From this, hidden or secondary impacts will be derived. The purpose is to measure the impact of the proposed change on your company's operation, changes in traffic and production patterns and hence the implications on the economy of Ontario. This goal cannot be achieved unless you can provide specific future and long term plan statements.

Our prime concern is that Ontario's economy should not suffer adverse affects as a consequence of the federal transportation strategy. We also feel that transportation modes should be as efficiently utilized as possible.



The only aim of this exercise is to find out the facts related to this problem so that we may recommend a rational course of action to the provincial government.

As already promised, the information asked for will be kept in strict confidentiality and will not be made available in any form that could identify it with any company.



MAJOR INBOUND AND OUTBOUND MOVEMENTS BY ALL MODES

COMMODITY -

Origin(s)

Destination(s)

Mode

Tonnage

Unit Price of  
Commodity\*

Unit Transpor-  
tation Cost

ANSWER FOLLOWING IF  
MOVEMENT BY WATER

Vessel - Private  
Bottom or  
Identify Carrier

Bulker or Self  
Unloader

Capacity of Vessel  
Generally Used

Rate

\* Inbound - Average purchase price for last six months  
Outbound - Average selling price for last six months

MAJOR INBOUND AND OUTBOUND MOVEMENTS BY ALL MODES

COMMODITY -

Origin(s)

Destination(s)

Mode

Tonnage

Unit Price of  
Commodity\*

Unit Transpor-  
tation Cost

ANSWER FOLLOWING IF  
MOVEMENT BY WATER

Vessel - Private  
Bottom or  
Identify Carrier

Bulker or Self  
Unloader

Capacity of Vessel  
Generally Used

Rate

\* Inbound - Average purchase price for last six months  
Outbound - Average selling price for last six months

MAJOR INBOUND AND OUTBOUND MOVEMENTS BY ALL MODES

COMMODITY -

Origin(s)				
Destination(s)				
Mode				
Tonnage				
Unit Price of Commodity*				
Unit Transpor- tation Cost				
ANSWER FOLLOWING IF MOVEMENT BY WATER				
Vessel - Private Bottom or Identify Carrier				
Bulker or Self Unloader				
Capacity of Vessel Generally Used				
Rate				

\* Inbound - Average purchase price for last six months  
Outbound - Average selling price for last six months

- (A) Identify those blocks of traffic susceptible to a modal switch covering those factors which determine or could precipitate a switch.
  
  
  
  
  
  
  
  
  
  
- (B) Identify those blocks of traffic which are permanently tied to water movement with reasons for permanence, (i.e. capacity constraints of other modes, internal plant limitations).
  
  
  
  
  
  
  
  
  
  
- (C) Identify those blocks of traffic moving by other modes which are based on water competitive rates. Provide tonnage figures and assess probable impact.



COMPANY STRATEGY

Main Plant  
Locations

Percentage of  
Business Handled

--	--	--	--

How would a toll increase influence your long and short term plans?

- Switch of location (specify)
- Contraction or expansion of capacity (Specify)
- Direct employment
- Lost or reduced markets (Specify)
- Price increases (Specify)
- Switch of transport modes

Commodity	From (Mode)	To (Mode)	Origin	Destination	Tonnage

Other comments

## Questionnaire

### Impact of St. Lawrence Seaway System Toll Increase

---

The aim of the attached questionnaire is to identify those areas and aspects of your operation which might be affected by an increase of tolls on the Seaway System and the Welland Canal.

This statement of purpose will hopefully enable you to correct us or to insert additional material wherever you think we have failed to ask a basic question.

The questionnaire will be used to establish the nature, volume and impact of your operation as well as to isolate that portion of it which in one way or another is dependent on the St. Lawrence System or the Welland Canal. We would like to obtain as precise a definition and description as possible of the traffic dependent on the Seaway System, including origins and destinations, commodities, rates and the possibility of shippers using alternative routes or modes. This material should outline explicitly and in detail the characteristics of the transportation operation. From this, hidden or secondary impacts will be derived. The purpose is to measure the impact of the proposed change on your company's operation, changes in traffic patterns and hence the implications on the economy of Ontario. This goal cannot be achieved unless you can provide specific future and long-term plan statements.

Our prime concern is that Ontario's economy should not suffer adverse affects as a consequence of the federal transportation strategy. We also feel that transportation modes should be as efficiently utilized as possible.

The only aim of this exercise is to find out the facts related to this problem so that we may recommend a rational course of action to the provincial government.

As already promised, the information asked for will be kept in strict confidentiality and will not be made available in any form that could identify it with any company.

## Toll Increase Impact on Ontario - Carrier Survey

### Description of Fleet

Number of ships  
in service

Name

Type of ship  
(i.e. tanker)

Length

Beam

Draft

Gross registered  
tons

Carrying capacity at  
seaway draft limit

Regular carrying  
capacity

Bulker or self-  
unloader

Utilization factor

Life of vessel  
remaining

Daily operating cost

Rough breakdown of  
cost components



## Toll Increase Impact on Ontario - Carrier Survey

### Description of Fleet

Number of ships  
in service

Name

Type of ship  
(i.e. tanker)

Length

Beam

Draft

Gross registered  
tons

Carrying capacity at  
seaway draft limit

Regular carrying  
capacity

Bulker or self-  
unloader

Utilization factor

Life of vessel  
remaining

Daily operating cost

Rough breakdown of  
cost components

Toll Increase Impact on Ontario - Carrier Survey

---

Description of Fleet

Number of ships  
in service

Name

Type of ship  
(i.e. tanker)

Length

Beam

Draft

Gross registered  
tons

Carrying capacity at  
seaway draft limit

Regular carrying  
capacity

Bulker or self-  
unloader

Utilization factor

Life of vessel  
remaining

Daily operating cost

Rough breakdown of  
cost components

Operation

For your entire fleet, please give approximate breakdown of operation in percentage terms. Indicate what the percentage is based on; number of vessels, volume of business or carrying capacity. Optimal would be tonnage carried.

	<u>Percentage</u>
Inter and Intra Upper Lakes above the Welland	
Inter lake - Welland Upbound	
- Welland Downbound	
Inter lake - St. Lawrence-Lake Ontario Upbound	
- St. Lawrence-Lake Ontario Downbound	
Inter lake - Both St. Lawrence and Welland Sections	

Major Cargo Movements

Commodity

Origin(s)

Destination(s)

Tonnage

Percentage in  
total

Bulker or Self-  
unloader used

Capacity of vessel  
generally used

Rate

Is this movement  
vulnerable to  
movement by other  
modes?



Major Cargo Movements

Commodity

Origin(s)

Destination(s)

Tonnage

Percentage in  
total

Bulker or Self-  
unloader used

Capacity of vessel  
generally used

Rate

Is this movement  
vulnerable to  
movement by other  
modes?

Future Plans

How would a toll increase influence your long and short-term plans?

- Discontinuance of service
- Relocation of plant or equipment
- Direct employment
- Lost or reduced traffic (backhaul effect)
- Increase in rates

Give a brief analysis of the elements in transportation practice and regulation which you feel are hampering your competitive position with respect to other modes of transport.

Identify the biggest problems confronting your shipping operation. Please elaborate.

Please give your own suggestions as to specific action that could be taken to promote the Great Lakes System.

Other Comments:

## SUBSIDIES

### General

The proposal by the Federal Government to increase tolls on the St. Lawrence Seaway System has found a very mixed reception.

On the one hand, associations of carriers and users have been strongly opposed to the increase in tolls and the media has taken this approach in reporting toll related issues.

On the other hand, the working contacts of most of the carrier and shipper concerns interviewed, demonstrated a reserved support of what they perceived to be a financially and economically sound principle of administration.

It is possible that the reaction to the toll increase was largely due to uncertainty and lack of information about a concrete plan. It is also possible that opposition arose from a natural disinclination to give up a favourable advantage. However, the study team detected a strong feeling that the shipping mode on the Great Lakes is being discriminated against with respect to other modes.

At the outset of this study, it was hoped that some inroads could be made into clarifying this issue. It was also hoped that some argument could be found that would either support or negate the discrimination argument. Lack of basic research and of the appropriate data on infrastructure costs in Canada



makes this task impossible. Therefore, the rest of this section is devoted to outlining some of the basic concepts, problems, and the data needs to be filled before this argument can be satisfactorily settled.

### Basic Concepts

A subsidy is a sum of money given to an entrepreneur or a concern to assist his operation. Usually a subsidy enables a firm to carry on a business and therefore provide a service which otherwise he would be unable to perform in the same fashion. Subsidies can be described in a myriad of ways depending on their nature, administration, purpose and effects.

A few of the pervading forms of subsidization in transportation are described below.

Infrastructure subsidy: the provision directly by the government or through assistance to firms or contractors of any or every part of the right-of-way, route, terminals or other basic capital required to operate the transportation equipment.

Operating equipment subsidy: direct provision or financial assistance to produce the vehicles and specialized equipment needed in the performance of the transportation service.

Operating subsidy: direct provision or financial assistance to provide day to day expenses of operating a transportation service.

Direct shipper subsidy: assistance to shippers to enable them to pay their appropriate cost share for the operation of a transportation service. This may occur either through financing of a rate differential, when artificially low rates are refunded to the operator, or direct financing of some basic equipment needed by the shipper.

In addition, all these forms of assistance may be direct or indirect. The government might transfer lump sums itself, provide capital or equipment, grant special privileges, such as tax exemptions, loans at low or non-existent interest rates, buy shares or stocks or simply grant monopolistic powers allowing the operator to cross subsidize its own operation through higher charges on some other portion of its services.

In general, any service must in some fashion be subsidized if it does not recoup the cost of its provision from those who directly benefit.

### Costs

In economics, the technical definition of the cost of a project is the sum of the benefits forgone by society or individuals given that the resources utilized for the project could have been employed elsewhere. For example, the monies, resources and labour already employed in laying down a mile of highway cannot be utilized in laying down railway tracks, building a lock or creating public parks.

The cost of this mile of highway is the benefits forgone from the alternative projects. A sound investment, from an economic point of view, would be such that the benefits it yielded were higher than those any alternative use of the same resources could provide.

All that the government has to do then, is to choose, from among the many possible forms in which the monies could be spent, that which yields the highest benefits, then execute the project. The justification for subsidizing one activity over another rests on this cost-benefit comparison.

However, the measurement of benefits and costs in an environment where consumers' needs are interdependent is a rather complex affair even in those cases where these can be determined or are known to the consumers themselves. In addition, benefits and costs change over time and depend on the social and technological framework in which they are measured. While a large set of tools has been devised to estimate cost and benefits, tangible and intangible, with the help of monetary proxies, past experience, etc., there exist within this field large areas where no other more rational analysis or decision making can be applied than a vote counting.

Cost benefit analysis and related techniques have evolve sufficiently that some inroads can and ought to be made into a more efficient allocation of public spending especially in areas where projects are comparable and goals substitutable. If it is a matter, for instance, of providing transportation service for a given capacity between two points, all the tools are there to find out which mode would undertake it at less cost, the monetary cost measure being many times an appropriate proxy for the social cost.

This task requires an adequate statistical base which takes into account modal differences as well as similarities and the reasons for certain conversion factors.

For instance, if it was required to estimate the highest social return for a given subsidy dollar, a proxy that could be used is the number of ton miles that could be transported by the given mode.

In transportation however, this proxy is too rough and inadequate. A ton mile of wheat cannot be equated to a ton mile of beef or a ton mile of recently printed newspapers. The analyst therefore has to provide the proper substitution ratios to compare a ton mile of freight capacity at a given service level with another at a different service level. Having done this, it would then be possible to compare say, freight capacity on an average ship on the Great Lakes transiting between Thunder Bay and the lower St. Lawrence ports, and freight capacity on the railways between the



same two points. The same type of comparison does not hold between just any pair of points. We cannot compare freight transported from Winnipeg to Vancouver with that transported between the head of the lakes and the sea unless we speak of the same type of freight and the two moves are substitutable.

While modal substitution might be directly comparable for some of the grain movements, the railway infrastructure in place in the west performs a host of other services which are not provided by the ships on the Great Lakes nor could be given both the technological and social characteristics of the latter system.

The arguments brought forward by Great Lakes users regarding subsidy levels on the rail network therefore have to be qualified to a great extent, and their qualification at the moment in Canada lacks the appropriate basic research.

The economic advantages inherent to a mode of transportation lie most fundamentally in its physical characteristics as they fit a geographic environment. This matching also has to be coupled to the type of function the mode is expected to perform.

As a transportation mode is not an aggregate of discrete components or packages, such that if a unit of mode  $x$  is added to the existing stock, service output increases by  $x$ , then, in examining the transportation output

of a mode it is necessary to consider the total transportation system, the requirements placed on it, as well as the service it provides.

Inherent advantages of modes may only be determined for total working systems. Modal comparisons must take into consideration the proper context within which evaluation can be made and reference this comparison to the appropriate service.

For instance, it would be of little relevance to compare the costs of providing a rail right-of-way and a water right-of-way where either one could not realistically be provided. On the other hand, when only one may be built, or where one would be prohibitively expensive in comparison with the other, proper attention should be paid to ensure that system development costs are not confused with the normal year-to-year service provision and thus bias the comparisons which are being made.

In Canada, transportation modes developed historically with little attention paid to these considerations. Furthermore, present day decisions regarding choice and marginal efficiency of one mode over the next are restricted by decisions made in the past. Rail developed in an era when really no other alternative existed. Highways are a response to technological advance of this century and an increased pace of life and economic activity. Railways would be unable to provide the type of service from which most of our highways derive their reason for being.

It would be idle to compare financing and treatment of different modes with each other on grounds of their greater or lesser contribution to economic life. Each component of the total system was developed with a rationale which was valid in its time, but which did not have the benefit of being part of a comprehensive long range plan. As a result, the system exists, with a great amount of sunk costs and vested interests. All of this makes rational analysis of future long range options, an issue which is more political than anything else.

The system which is now in place does present area of overlap and possibility of duplication of service. It is the task of government therefore to steer economic activity in such a way that those types of services which cost the least to provide, obtain greatest utilization, all costs taken into consideration. In our own economic environment, this also involves keeping in place the proper mix of choice, excess capacity and incentive systems which allow the competitive market to steer and control economic as well as government activity.

Present day decisions have an impact on the choices of the future and therefore, the environment in which private business acts should also consider the most efficient future transportation system possible. This is not necessarily a consequence of a decision which optimizes investment today but over time.

What all this means then, is that there cannot be a simple acceptance of the type of argument regarding subsidy and subsidy levels which has been fashionable lately in seaway related polemics to either justify government activity or attack it.

It is improper to compare the subsidy level on one type of service with an other without at the same time having established all other terms of comparison and hence comparing like with like.

Often, confusion is made between economic efficiency and some perception of fairness. The Great Lakes Shipping industry has argued that it is not fair for the railways to be subsidized to the extent that they are while their own financial position is not assisted. Some statistics on subsidy levels to the different modes are included as a source of information. The claim bears further examination.

Subsidization of transportation modes may contribute to the existence of a given service, and should be practiced with a view to maximize the return per dollar of subsidy invested. However, subsidies may have a series of side effects and certainly do have ramifications in the total area of resource allocation. Essentially, the provision of a subsidy alters the working of the price mechanism as a signaling system for indicating the economic advantages of one mode over another. It would be wrong to state though, that all subsidy ends in misallocation or that any and every subsidy results in economic mismanagement.

Since subsidies ultimately proceed from the public purse, in those cases where the benefits of a project are sufficiently widely spread, it makes much more sense to use tax monies directly than to contrive costly and burden-



some user-collection systems to recover expenditure, especially since the ratio of cost of collection over revenue is usually higher in these cases. Much of the highway and railway infrastructure in Canada falls in this category, and so, subsidization would be economically justified. The proviso for this practice, however, is that measures be established which can prove that the cost of the project, provided at public expense, would be recoverable from the benefits accrued.

The misallocative element of public financing resides mostly in the alteration of the cost relations among several services. Thus, if two modes provide the same services and, as a result of making one less expensive because of government subsidy, shippers end up using this mode; it can be said that misallocation has occurred. This is so since, if the subsidy had not existed, the second service would be relatively more expensive and users would have chosen the first one. In total dollar terms the same total service would have been provided at lower cost.

This simplified version of the theory of efficient allocation is certainly very different from any concept of fairness. In fact, the existence or non-existence of a subsidy does not usually have a bearing on the operating profits derived by an entrepreneur. Furthermore, only those subsidies are of concern to transportation firms which would result in changed patterns of demand, e.g., which would influence shippers to make wrong economic choices.

To estimate whether particular subsidies have this influence requires a very careful and detailed product by product investigation. This task is not only beyond the scope of this study, but the attempts which have been made in this direction in Canada so far have usually been too broad and too aggregated to make the comparisons valid.

In his articles on Transport Costs and Revenues in Canada, (\*) Z. Haritos carried out a very detailed and careful analysis of the costs and revenues associated with each mode of transport across Canada.

He isolates Civil Aviation, Marine, Road and Rail and for each provides after painstaking research a fairly complete, and, in the aggregate, quite descriptive table of costs and revenues, for several values of the rate of cost of capital.

The measurement of the costs by cost categories and of revenues by sources, allows the establishment of the rate of direct user financing of the several modes of transportation as well as the degree of government involvement in their subsidization.

However, in these articles only the broad aggregates of costs are explored and summarized without any research of the corresponding service indices, modal output or any average performance measure. Thus, the relative de-

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\* In Journal of Transport Economics and Policy, January 1975, Vol. IX, No. 1 and in Transportation Subsidies - Nature and Extent, Karl Ruppenthal ed. C.T.S., U.B.C. Vancouver, Canada, 1974, pp. 57-74.

gree of financing, user recovery shortfall, as well as the total cost and revenues have been derived but cannot serve as a basis for deciding on a more adequate financing scheme.

For 1968, Harito's calculations indicate the relative financial cost and deficit picture of the different modes to be the following:

TOTAL TRANSPORT COST DEFICIT  
CANADA - 1968  
(In Millions of Dollars)

Mode	Infrastructure <sup>2</sup> Cost	Vehicle Cost	Total Modal Cost	Modal Costs as % of Total Transport Costs (%)	Total Deficit	Total Deficit as % of Total Costs (%)
Air	208	587	795	4-3	154 <sup>3</sup>	19-3
Marine	394	937	1,338	7-3	339 <sup>4</sup>	25-5
Road	1,876	12,462	14,338	78-4	529	3-7
Rail	477	1,275	1,832 <sup>5</sup>	10-0	496	27-1
Total	2,975	15,920	18,295	100-0	1,518	8-3

<sup>1</sup> Totals may not agree, because of rounding of figures.

<sup>2</sup> At a 6 percent rate of cost of capital.

<sup>3</sup> Includes \$1.6 million in direct subsidies paid to regional air carriers, which are not included in Table 1.

<sup>4</sup> Includes \$29.2 million in direct subsidies to Canadian for-hire water carriers, which are not included in Table 2.

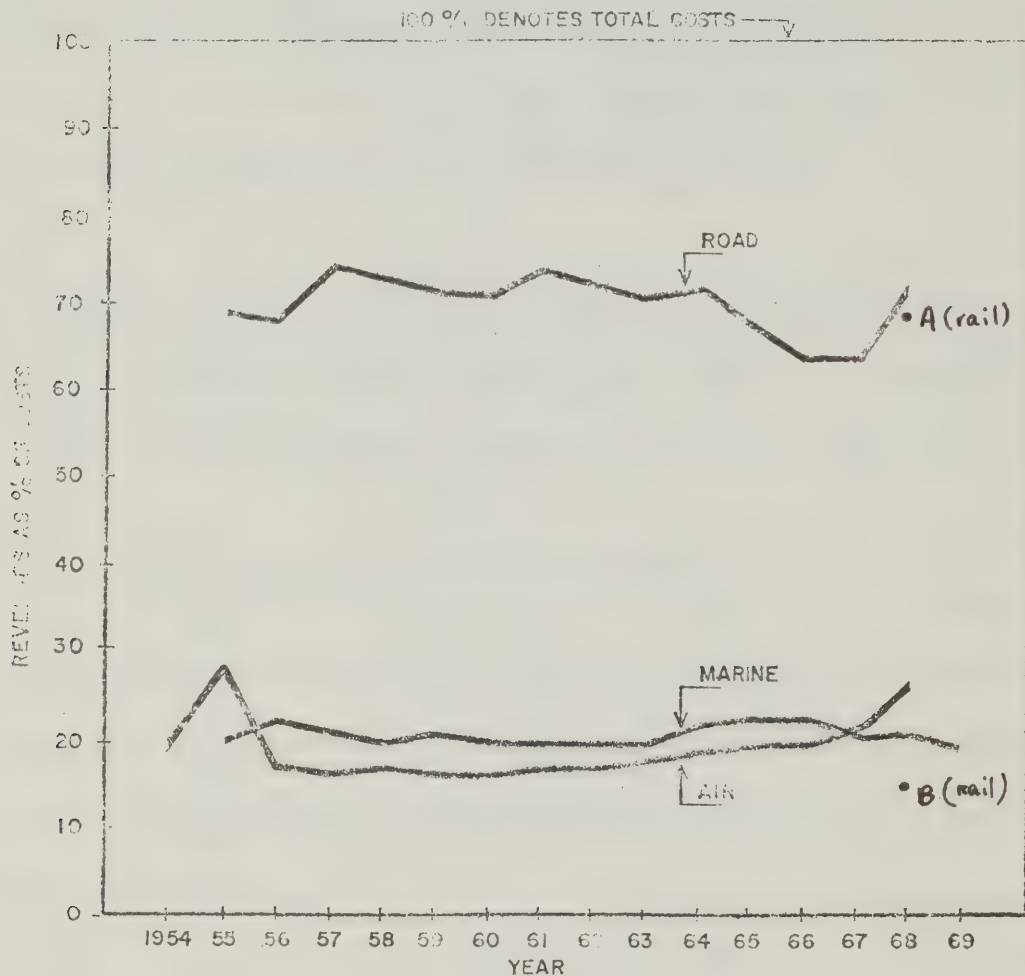
<sup>5</sup> This figure in addition to infrastructure and vehicle costs includes also \$79 million of corporate taxes and regulating costs for 1968.

It is important to note as well, that these figures do not break up the freight and passenger components for the different modes.

As regards relative recovery from direct user financing he shows the following figure for 1954-1969.

TRANSPORT COSTS AND REVENUES IN CANADA

Z. Haritos



*Revenues Expressed as a Percentage of their Respective Total Costs for  
Air, Marine, and Road Transport Infrastructure: Canada  
(Rate of cost of capital: 6 per cent)*

Even at this level of aggregation, for instance, the institutional setting of railways relative to the other modes yields several plausible methods for comparing rail with the several modes, each of which would show quite



different results. For instance, by prorating revenues on a cost basis, the rail would have been at point A in 1968. However, allocating all revenues to vehicle cost would have placed rail at point B.

A comparison of the tonnages carried by the various modes of transportation is provided by the same publication.

NET TONS CARRIED BY MAJOR FACILITIES/MODES: RECENT  
(Millions of Short Tons)

Facility/Mode Commodity	Rail (1972)	West Coast Ports (1971)	Lakes Ports (1971)	Welland Canal** (1971)	St. Lawrence Seaway** (1971)	East Coast Ports (1971)	For Hire Trucking† (1972)	Private Trucking- (1972)
All Grains	34.6	7.6	13.3*	23.8	22.6	10.2		
Iron Ore	45.8	1.2	6.7	13.6	13.4	43.3		
Coal	15.0	6.1	16.7	9.7	0.8	0.3		N/A
Potash and Sulphur	13.2	4.0						
Forest Products	19.2	3.6	0.3			1.9	6.2	N/A
All Other Bulk	70.1	2.6	0.8			10.8	38.0	N/A
General Cargo	27.5	6.6	5.1	15.8***	16.1***	11.7	64.8	N/A
TOTAL	225.4	31.7	42.9	62.9	52.9	78.2	109.0	63.0

- \* Includes 0.7 via the Port of Churchill, Manitoba  
 \*\* Includes traffic originating both in Canada and the U.S.  
 \*\*\* Includes other bulk as well as general cargo  
 † Estimates for intercity carriage; excludes urban trucking.

In addition, crude oil and natural gas pipelines in Canada generated over 90 billion ton miles.

Source: Transport Canada An Interim Report on Freight Transportation in Canada, Ottawa, June 1975.

# TOTAL TRANSPORTATION COST AND DEFICIT<sup>1</sup>

CANADA - 1973

(In Millions of Dollars)

Mode	Infrastructure <sup>2</sup> Cost (\$M)	Vehicle Cost (\$M)	Total Modal Cost (\$M)	Modal Costs As a Percentage of Total Transport Costs (Percent)	Deficit for Each Mode (\$M)	Deficit as a Percentage of Total Costs for Each Mode (Percent)
Air	354	1,163	1,516	6	2433	16
Marine	576	1,892	2,469	9	534 <sup>4</sup>	22
Road	3,191	17,162	20,353	76	1,165 <sup>5</sup>	6
Rail	661	1,771	2,548 <sup>6</sup>	9	671	26
Total <sup>6</sup>	4,813	22,073	26,886	100	2,614	10

1. Total may not agree due to rounding.

2. At a 6 percent rate of cost of capital; in 1973 prices.

3. Includes \$2.1 million in direct subsidies paid to regional air carriers.

4. Includes \$67.7 million in direct subsidies paid to Canadian for-hire water carriers.

5. Includes \$14.5 million in direct subsidies paid under the Atlantic Region Freight Assistance Act.

6. This figure in addition to rail infrastructure and vehicle costs also includes \$115.2 million of corporate taxes and regulating costs for 1973, for rail.

Source:

This Table is an Update of Table 6 in Z. Haritos' "Transport Costs and Revenues in Canada", Journal of Transport Economics and Policy, Volume IX, No. 1, January 1975.

Transport Canada: An Interim Report on Freight Transportation in Canada, Ottawa, June 1975.

Even from this table it is obvious that the several modes are linked with each other in terms of performance of a number of services (a fact highlighted throughout the report, thus invalidating the modal breakdown of financing or at least showing that such practice could be misleading).

From the above tables, CTC derived the following charts. The text accompanying them is reproduced as well.\*

#### Government Transport Expenditures and Recovery Through User Charges

This section considers government transport expenditures in 1973 and the extent to which these were recovered through user charges... Government expenditures on the different modes can, of course, vary from year to year because of problems such as the lumpiness of major investments; the alternative would be to examine costs attributable to each year but this is a much lengthier process involving complex cost allocation decisions.

User charges, levied mainly through licence feeds and fuel taxes, allowed recovery from commercial motor carriers and private automobile users of almost two-thirds of total government expenditure on the highway mode in 1973. Cost recovery was much less in the marine and air modes, where roughly one-quarter of government expenditure was recovered from users. The expenditure on the railways, mainly subsidies for uneconomic passenger services and uneconomic branch lines, did not produce any corresponding revenue.

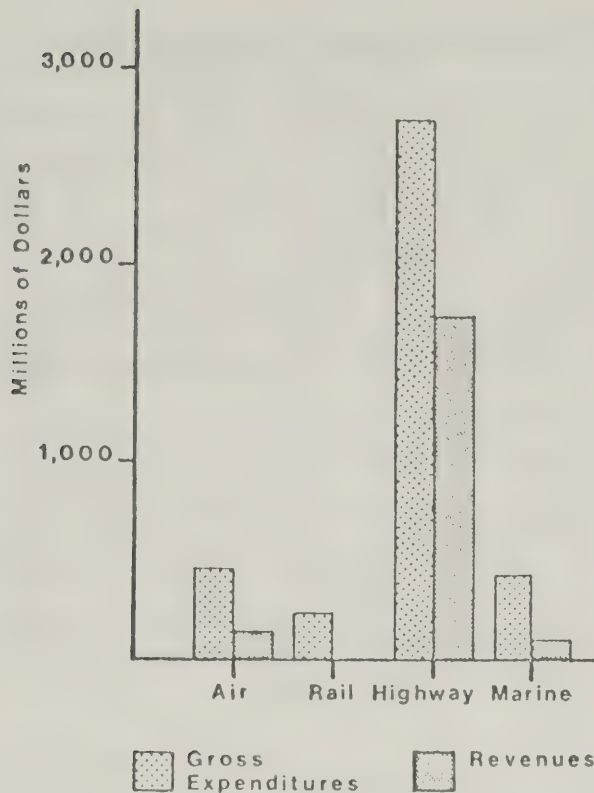
In total, the various levels of government were left in 1973 with nearly \$2 billion of transport expenditures that were not recovered from user charges. The highway mode accounted for about half of this unrecovered expenditure, air and marine for just under one-fifth each, and rail for about one-eighth. The second chart shows this unrecovered government expenditure in relation to total expenditure by carriers and the government for each mode. Unrecovered government expenditure was relatively greatest in the air mode, followed some way behind by marine, rail and highway.

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\* CTC Transport Review, Trends and Selected Issues, February 1977, p. 50.

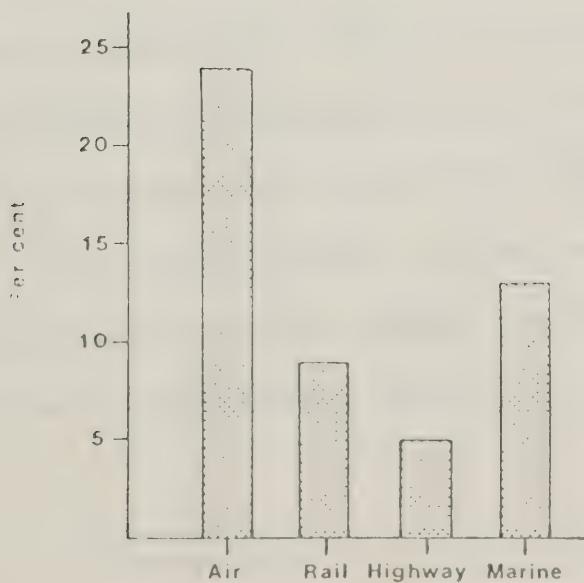


# Government Transport Expenditures\* and Revenues by Mode: 1973



Source: Canadian Transport Commission

## Government Expenditures Less Government Revenues as Percentages of Total Carrier and Government Expenditures: 1973



Source: Deficits from Section 6.2; Total Expenditures from Exhibit 14, An Interim Report on Freight Transport in Canada, Transport Canada, June 1975.

Direct subsidies to transport modes, as detailed by the same CTC publication: \*

### Federal Government Direct Transport Subsidies

This section covers only direct subsidies paid by the federal government to carriers and does not include government expenditures on infrastructure...In 1975, total federal government subsidies of this type amounted to \$418 million. These subsidies were only provided to carriers on condition that specified services were provided, ranging from rail branch lines to regional air services. It is therefore arguable, to varying extents, that these direct subsidies are of benefit to transport users more than to transport carriers.

Of the direct subsidy payments of \$418 million, almost two-thirds were paid to the railways in 1975. Uneconomic passenger services accounted for approximately 70 percent of these railway payments. In 1973 and 1974, railway subsidies were boosted by payments to offset the effects of the partial freight rate freeze operative from mid-1973 to end 1974. Smaller subsidies totalling \$6 million, but not shown in the table, were paid to highway and water carriers to compensate for the effects of the freeze.

Payments to water carriers in 1975 amounted to three-tenths of the total subsidy payments shown in the chart. These were mainly in respect of subsidies on water services in Atlantic Canada. Maritime Freight Rates Act payments for rail movements are included in the chart under rail. Payments under the Atlantic Region Freight Assistance Act are mainly in respect of highway transport. Finally, air subsidies are paid by the Canadian Transport Commission to certain regional carriers to cover operating deficits on specified services, but in total these amounted to only \$2.5 million in 1975.

It is obvious that analytical work in subsidies so far, while a fundamental first step is inappropriate as a decision making tool for allocating subsidies. The data available is aggregate and takes only into consideration an average service level. Since there is no average service level, but only specific services, investments and subsidies in transportation have to be looked at from the point of view of all the characteristics of the various input and output components.

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\* Ibid; p. 51

**Federal Government Direct Subsidies  
to Carriers: 1967-1975  
(millions of dollars)**

	Railways	Water	Atlantic Region Freight Assis- tance Act	Air	Total
1967	133.7	32.8		1.6	168.1
1968	110.0	34.2		1.6	145.8
1969	96.9	34.9	0.2	2.0	134.0
1970	93.1	38.2	1.4	1.9	134.6
1971	122.0	40.7	5.1	1.6	169.4
1972	157.9	47.0	10.2	1.9	217.0
1973	222.6	65.6	14.5	2.1	304.8
1974	356.4	109.8	21.7	1.9	489.8
1975	268.3	123.5	23.7	2.5	418.0

Source: 1) Canadian Transport Commission  
2) Public Accounts of Canada

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Ibid.p.51.

### Modal Characteristics

Each transport mode has areas of exclusive advantage and areas where it is irreplaceable by any other service as the following descriptions show:

#### Water:

Water movements have the advantage of a high load to capital equipment ratio and very low ratio of energy for ton mile moved on line haul, there is a high degree of versatility as long as shipping or receiving points are on the water route.

The low costs of equipment for load carried can only be achieved by large size vessels. This puts an onus on the shipping and receiving terminals as well as the ports, for all have to correspond to the vessel characteristics. The capital costs involved in this sort of work can become extremely high.

At terminal, water has no versatility: beginning and end point distribution has to be performed by other modes. Given optimal terminal planning, the tying up of storage space, moving stock and the operating costs of the most efficient distribution of the on-shore unloading, storing and distribution equipment should be considered a cost inherent to the water mode.

These costs can, comparatively speaking become extremely high and force abandonment of the mode unless proper waterside plant location is possible. An industrial plant can only commit itself in this way however if the in or outgoing traffic flow is expected to remain in the long term or if ready access to alternative modes exist.



In addition, on the seaway the severe problem imposed by seasonality of operation to which users have to seek complex adaptation poses a major problem.

Rail:

Rail has comparatively cheaper right-of-way - infrastructure costs than, say highways or dredged canals. However this cost advantage is eroded by the specificity of the right-of-way use. Only very strict scheduling and costly overseeing grants high right-of-way utilization which in the best of cases cannot approach the capacity limits afforded by the far more versatile highways and waterways.

The right-of-way - scheduling constraint imposed on railway capacity along any point on its route is only reached on certain bottlenecks in the case of the other modes (with the exception of pipelines) and usually at much higher capacity tonnages. Therefore, for right-of-way sunken capital, the utilization factors can only be very low.

Railway has relatively low (not as low as water) line haul costs deriving from high load factor to rolling stock ratios and relatively low energy consumption per ton mile moved.

The versatility of the railways, subject to infrastructure capacity limitations, is relatively high.

The ratio of sunken capital to service output ratio is relatively low. A railway requires to be a fairly complex system before it can start rendering service. This however is mostly a financial cost as the returns to scale are higher in comparison.

Highway:

For this mode, the standards of the right-of-way infrastructure vary to such a great extent that no easy conclusions can be reached as to relative cost in comparison with other modes. However, given the great variety of vehicle types, very low right-of-way investment is immediately compatible with service output. The relative variety and design multiplicity of vehicles makes the highway mode the most versatile of all and the one that, to the largest extent, interacts with every aspect of our economic life. As a consequence, the spillover and secondary effects of the highway mode span a complex web that is difficult to identify and define properly.

As far as versatility is concerned for any and all types of movements, it exhibits the greatest but suffers from a low ratio of load to moving equipment and low ratio of energy user to ton mile output, thus making the line haul costs relatively high. As well, secondary disbenefits such as accident risks and pollution generation are higher than with the other modes. The highway mode thus loses justification for long journeys but has become an almost indispensable element of beginning and end point distribution patterns.

From the foregoing brief descriptions it is clear that no easy solution exists to the question of which mode to subsidize and where the greatest efficiencies or service returns are to be reaped from a dollar of investment.

This question depends on the service considered, the locations of the customers and the amounts involved as well as on the possibilities of backhaul among other things.

A different analysis is necessary when part of the infrastructure is present as opposed to the case where either mode has to be built from scratch.

In the case of the seaway, comparisons are definitely inappropriate in the aggregate, they have to be carried out for all the specific commodities as the extra or additional versatility or existence value of the system is very low in comparison with the other modes.

All this indicates only the complexity of the task awaiting the analyst of public expenditure in transportation as well as the reasons why the data there exist presently on subsidies are inadequate.

In summary:

- the subsidies argument is extremely cloudy and needs profound examination, detailed theoretical analysis based on a good basic data structure depicting the practical day to day cost and performance realities before conclusions as to the allocation effect can be drawn;
- comparison of any and every subsidy is methodologically wrong and misleading;

- subsidy levels on the different modes are not an indication of fairness or equity;
- in the cases where components of services offered by different modes are substitutes, every effort should be made not to alter the cost relationships between the modes or to allow a mode to cross-subsidize this section of the operation to gain a competitive advantage, especially if this cross-subsidizing proceeds from financial help derived from the public;
- the "user-pay" concept or direct cost recovery from the sector of the public who benefits should not become a dogma of government, especially in those cases where the benefit is not a direct effect on a user but on a third party far removed from the system itself. The recovery scheme is inherently related to the "spread" of the benefit and should not be confused with the ease of collection.

Before finalizing this part, it is worth remembering that the "accounting" that goes on when parties to an argument start listing benefits and disbenefits inherent to their activity can become very destructive, especially when the concepts have not been clearly defined and when the measuring units have not been agreed upon. The attitude that is generated by irresponsible bandying about the cloudy concepts can easily lead to harmful



animosity. As witness the recent round of arguments and counter-arguments about the advantages and costs of confederation between Quebec and the Federal Government.

Such an atmosphere is also present in the toll issue and therefore every effort should be made to collect the appropriate information to clear this issue.

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